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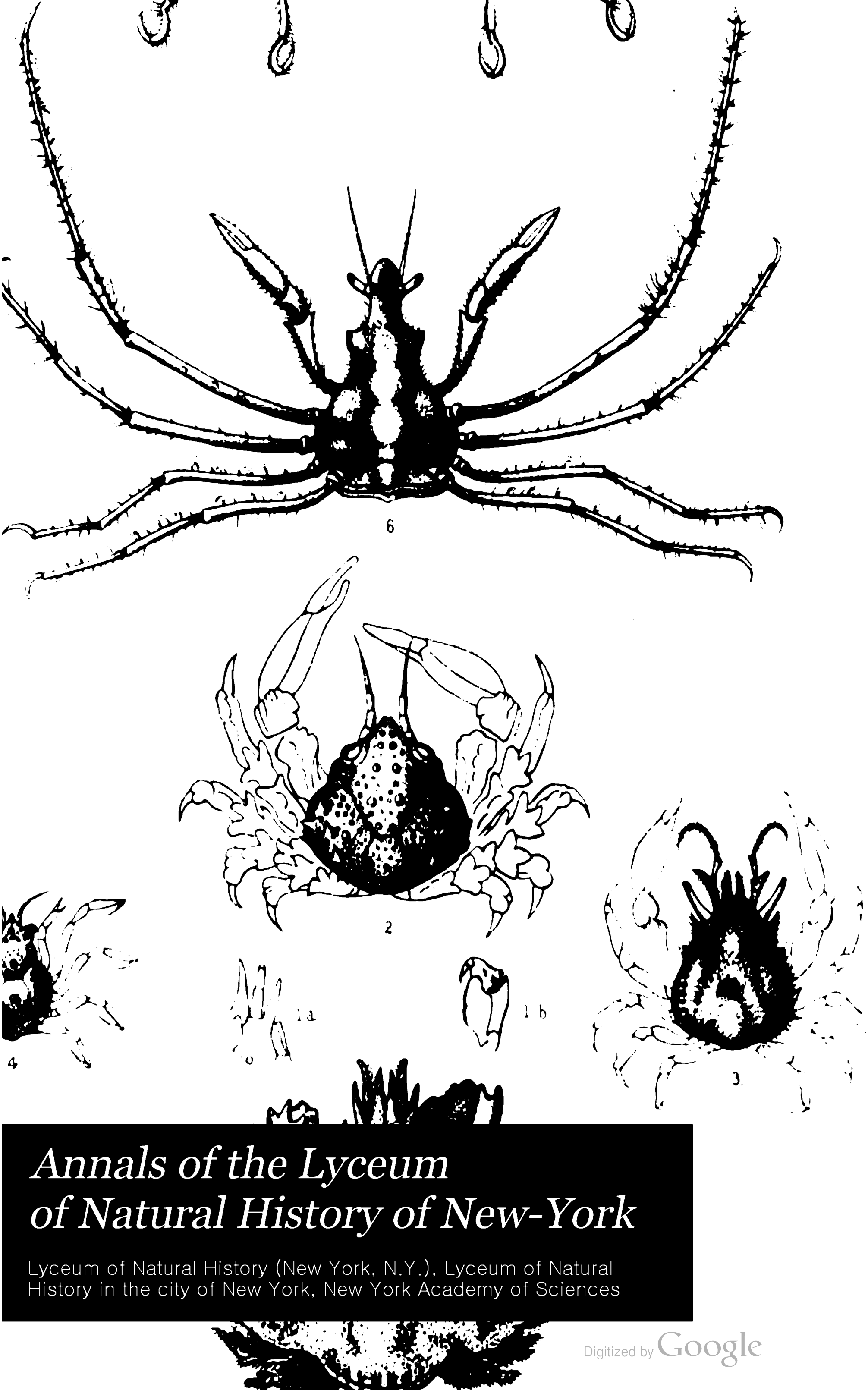

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ANNALS

OF THE

LYCEUM OF NATURAL HISTORY.

I.—*Descriptions of Several New Species of* SALMONIDÆ, *from the North-West Coast of America.*

BY GEORGE SUCKLEY, M.D.

Read December 6, 1858.

Salmo Gibbsii, Suckley.

COLUMBIA SALMON-TROUT: GIBBS'S SALMON.

SYN.—*Fario tsuppitch*, GRD. in Proc. Acad. N. Sc. Phil. viii. 218, 1856.
GRD. Rep. on Fishes, U. S. P. R. R. Surveys, 310, 1858.
[Non *Salmo tsuppitch*, RICHARDSON.]
Black-spotted Salmon-trout, LEWIS & CLARKE.

FIGURES.—The typical specimen of the present species is figured as *F. tsuppitch* in the Pacific R. R. Reports, *Fishes*, Plate LXIX.

SP. CH.—Body elongated, compressed, fusiform in profile; dorsal profile but slightly arched; snout rounded, the jaws sub-equal; maxillary gently curved, dilated posteriorly, and extending to a vertical line passing slightly behind the orbit; anterior margin of dorsal nearer the extremity of the snout than to the insertion of caudal fin; colors of the head and back, in the fresh specimen, rich dark olive green, profusely dotted with roundish black spots, the scales in certain lights showing bright silvery reflections; sides below the lateral line are usually unicolor, of a yellowish white; inferior fins unspotted; tail and upper fins yellowish olive, *profusely* spotted with round and oval spots of black, each spot being from one to two lines in diameter, and completely isolated from the others, *not confluent* as in some other species; caudal fin moderately lunated, *not forked;* head small; teeth small, and very numerous, especially on the labials; length of the full grown adult rarely exceeds 2 feet.

Habitat.—The Columbia River and its larger affluents. The species is apparently not anadromous, but seems to remain in the fresh waters throughout the year.

The typical specimen upon which the foregoing description is based, is a single skin contained in the Smithsonian collection, Cat. Number 940—that of a female obtained by the present describer, at Fort Dalles, Oregon, April 5th, 1855. The species is known to the *Walla Walla* Indians as the *Shoo-shines*, and to the *Wascos* by the name of *Ic-kwan-eek.*

Mr. Girard, mistaking the specimen for the *S. tsuppitch* of Richardson, figured and described it as belonging to that species. Upon his attention being called to several marked discrepancies between the account given by Sir John Richardson of the *S. tsuppitch*, and certain characteristics of the specimen from Fort Dalles, he at once coincided with me in considering the two species distinct. According to Richardson the *S. tsuppitch* has the dorsal, anal, and caudal fins *destitute of spots*, and the tail *forked.* The present fish, on the contrary, has the tail but *moderately lunated* at its extremity; and the dorsal fins and tail are *profusely spotted with black.* These prominent differences, besides many others less striking, have been deemed sufficient to settle the question of non-identity of the two species; and as no recorded description seems to refer to the present salmon, it is now presented as a new species under the name *Salmo Gibbsii*, in honor of my valued friend George Gibbs, Esq., Geologist to the N. W. Boundary Commission, and for many years a resident of Washington Territory. To Mr. Gibbs more than to any other individual am I indebted for rare specimens in all branches of Natural History, and especially for information, aid, advice, and encouragement while endeavoring to elucidate the history of the Salmonidæ of the N. W. coast.

Salmo truncatus, Suckley.

SHORT-TAILED SALMON: SQUARE-TAILED SALMON.

Typical Specimen No. 1134, Smithsonian Collection.

The specimen upon which the description of the present species is based was an adult female, obtained by the writer in the Straits of Fuca, in February, 1857. Its body was fusiform, in its dorsal profile resembling somewhat the *S. quinnat* RICH. It was, however, more slender than that species, and differed greatly in the form of the head and tail, besides having other marked characteristic distinctions.

SP. CH.—Body fusiform; dorsal profile moderately arched; anterior margin of dorsal fin *much* anterior to a point equidistant between the nose, and the insertion of the tail; head small; jaws fully provided with small teeth; tail small, its free margin, when extended, being almost straight, having a very faint tendency to lunation; scales generally *large*. Colors of the *fresh run fish*, back of head, back, dorsal and caudal fins bright blue, spotted on the head with roundish, on the fins with oval spots of black; the blue of the back is silvery, that of the head and fins darker; lower parts silvery white, this color extending about an inch above the lateral line, and merging itself irregularly into the color of the back; no spots below the lateral line, which is faint and of a bluish dusky color; lower fins pale and unspotted, their tips somewhat darkish.

From the vague distinctions separating the different species of Salmonidæ, which, although frequently obviously distinct, yet approach each other in so many characters, differing only in shade and intensity,—it is very difficult to give a concise and striking summary of the leading characters of any one species, so that by reading a short synopsis those nearly allied may be readily distinguished. This difficulty is strongly felt in characterizing the present species from several others having many points in common, and when in addition to the great resemblance of typical specimens of the healthy fresh run adults, we add the perplexities induced by changes in age, sex, and condition, confusion becomes only the worse confounded. To remedy these unfortunate obstacles to success, will require years of patient labor and investigation.

The following brief diagnosis may serve to assist in distinguishing the present species from its nearest relatives found in the same region. From *S. quinnat* Rich. it may be known by the much smaller head, and rounded—not pointed—snout. The smooth triangular projection extending in front of the *symphysis mentis* of that species is also wanting. The tail of the adult *S. quinnat* is very deeply lunated—almost *forked*, that of the present species is so abruptly terminated that it has suggested the specific name applied, the end being almost as abruptly truncated as if chopped off with a large knife. In this respect it resembles the adult male of the *Salmo trutta* Lin., as figured in Agassiz' *Histoire Naturelle des Poissons d'eau douce, Planches, Livraison I. Tab. VII.*

Another difference is in the greater size and thickness of the *S. quinnat*, which not unfrequently attains a weight of 30 or 40 lbs., whereas the present fish is usually found not exceeding ten or twelve pounds, and generally much less; and its common length when full grown rarely exceeds 32 inches. From the *S. gairdneri* of Richardson (not of Girard—see Fig. LXXI. Pacif. R. R. Reports, which is drawn from the young of some other species), it is more difficult to be distinguished, both having many characters in common. It is possible that hereafter, upon accurate comparison being made with numerous specimens, they may be found identical. In studying the specimens at present in the Smithsonian collection, we were obliged to confine ourselves to the examination of two imperfectly dried skins of the *S. gairdneri*, and one of the present species, which as yet are the only representatives of those species contained in the collection. The following differences however were found. The *S. truncatus* has the head smaller, and shorter; tail neither so wide nor so long, and more spotted; teeth in the lower jaw more numerous, but smaller; muzzle and chin more pointed; body posterior to anal fin more slender. The lengths of the three skins were much the same, those of the *S. gairdneri* being slightly greater. The teeth of the latter are larger and more scattered, being in one specimen 9. 9. and in the other 10. 10., on the arms of the lower jaw. Those of the *S. truncatus* have 14–16 on each side, and although in line, were dispersed in a pair-like manner, i. e. every other interval being greater. This pair-like disposition of the teeth is not seen in the *S. gairdneri.*

From the *S. gibbsii* it may be known by its greater size, and much brighter colors; proportionally smaller tail, and fewer spots. The dental arrangement, however, is much the same—barring the absence in the *S. gibbsii* of the pair-like distribution of the teeth, already spoken of. This peculiar dental arrangement may be accidental in the specimen preserved, and has therefore not been included among the specific characters of the species. For the same reason, the well marked presence of *a double row of vomerine teeth* was not included. Indeed the specimens of the species of Salmonidæ from the Pacific coast of America, now in the Smithsonian collection, vary so much in regard to the arrangement of the teeth on the vomer, that I have no hesitation in rejecting, for the present, the Genus *Fario* of Valenciennes. In this view I am *now* upheld by Mr. Girard, who informs me that had he received some valuable specimens from the Pacific coast at an earlier day, he would have ignored the Genus in his Report on the Fishes obtained on the Pacific Railroad surveys. It is very probable that the arrangement and number of the vomerine teeth depends greatly on the *age* of the individual, and may also ordinarily vary much in individuals otherwise alike.

The female obtained by me from the Straits of Fuca had a very short, small head, forming about one-thirteenth of the total length of the fish. Female salmon usually have smaller heads than the males; but I do not remember ever seeing those of any species so small, compared to the total length of the body, as in the present instance. The under jaw was received nicely and accurately within the upper. The labial, inferior maxillary, and vomerine teeth are very uniform in size, and quite small, those of the intermaxillary larger—but still small.

The name given to the species by the Klallam Indians is *Klutchin;* and I suspect it is the same as the *Skwowl*, or silvery winter salmon of the Nisqually Indians. Its flesh, when fresh-run, is of a bright salmon-red, and inferior to that of none of the class for the table.

Salmo gibber, Suckley.

HUMP-BACKED SALMON.

Hunnun of the Lumnies. *Huddoh* of the Nisquallies.

Typical specimen in Smithsonian Collection, Fishes, No. 1132.

SP. CH.—*Male.* Dorsal profile much more arched than in *S. scouleri* RICH. After entering fresh water, an adipose hump becomes strikingly apparent, its greatest prominence being nearly opposite a point midway on a line drawn from the eye to the anterior margin of the base of the dorsal fin; intermaxillary projection curved strongly downwards as in *S. scouleri;* jaws long, as in the latter, the lower terminated by a dilated knob (as in several other species of the genus), which is armed with four or five strong sharp teeth on each side; labials and limbs of the lower jaw closely set with very fine sharp teeth, finer and more numerous than those of the *S. scouleri;* vomerine and palatine teeth much larger than those of the labials; tail rather strongly lunated, and profusely dotted with elongated oval dark spots; the other fins usually unspotted, adipose rather elongated; scales much smaller than those of the *S. scouleri.*

The colors of this, like those of other species, vary much after the fish enters fresh water. Those caught in salt water are more or less silvery. After entering fresh rivers the color of the upper parts becomes of a dirty greyish yellow; below, white blotched with yellow. These colors, however, vary considerably in different individuals.

Habitat.—North-west coast of America, entering the rivers in the vicinity of Puget Sound for spawning purposes early in the autumn of every alternate year.

Dr. Kennerly, who obtained the typical specimen of the present species at Anaimo, Vancouver's Island, Sept. 22, 1857, remarks in his notes that it was a male, having the "head greenish yellow, clouded with black: opercula dull pinkish. Upper parts dirty greyish and yellow: under parts white blotched with yellow. Ventral and pectoral fins grass green, dorsal ultramarine blue and green. Tail blotched (spotted ?) with black."

The teeth on the limbs of the lower jaw of this specimen extend backward only half their length. Tongue apparently destitute of teeth. Branchial rays 11. 11.* Total length 25½ inches. Length of head 7 inches. Depth of hump 7 inches.

This species, according to the residents of that portion of the world—both whites and natives—appears only biennially, choosing the "odd" years. On its first arrival it is fat and of good quality, but soon becomes lean and unsavory. In many respects this fish strongly resembles the GORBUSCHA, or *Hump-backed Salmon* of Kamtschatka, spoken of by Pennant, and

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* Measurements and colors furnished by Dr. C. B. Kennerly, Naturalist to N.W. Boundary Commission.

Pallas, and alluded to by Richardson in the Fauna B. Americana, but differs much in size. This subject will be spoken of more in detail in a paper now preparing for the P. R. R. Reports.

Salmo confluentus, Suckley.

Typical specimen in Smithsonian Collection, Fishes, No. 1135.

Sp. Ch.—*Male.* Form stout; dorsal profile rising to a point just anterior to dorsal fin, then rapidly tapering to tail; dorsal, adipose, and caudal fins profusely spotted; caudal broad and *moderately* lunated. Adipose opposite anal, and much elongated; spots along the back and sides, generally linear or V-shaped, others irregular (but few round), and covering from two to five scales; the most common cover three scales and are about half an inch in length; fins on under parts unspotted, as also all parts beneath the lateral line.

A triangular bare projection of the chin anterior to the front teeth, as in the *S. quinnat;* scales scarcely as large as those of *S. truncatus.* Teeth of irregular size, and not so closely disposed on the arms of the jaws and labials as in *S. gairdneri:* middle of dorsal fin nearly opposite a point at the middle of the total length.

Differs from *S. quinnat* in having the tail but moderately lunated at the extremity, that of the latter being so deeply cut out as to be almost forked.

Habitat.—N. W. coast of America, entering the rivers for spawning purposes during the spring, and continuing throughout the summer.

The typical specimen, from which the foregoing description was taken, is a dried skin now in the Smithsonian Collection, procured by the present describer from the Puyallup River, near Fort Steilacoom, W. T., Sept. 27th, 1856, and called by the Indians who saw it *To-oh-odlt.* The Indians seem to apply the same name to another species of salmon, as I have heard of a gigantic kind only found in certain localities, which is also called *To-oh-odlt.* The colors of the specimen procured—an adult male—were evidently much changed by long residence in fresh water, and the exhaustion consequent upon procreation. This was rendered evident by the altered appearance of the jaws and teeth, as well as by the lean condition of the fish. The colors, as they appeared, were as follows: Upper parts dingy olive-green, profusely spotted with diagonal and confluent spots of dark brown, or black. Lower parts dingy yellowish white, unspotted, but tinged with a reddish band along the flanks.* Dorsal, adipose, and caudal fins dark yellowish green, spotted profusely with dark brown or black.

The examination of the dried skin shows branchial rays 13. 14. as near as can be counted. The condition of the specimen is such that no reliable statement can be given of the number of fin-rays. Length of skin 29 inches. Insertion of anal fin about 2¾ inches in length. A single tooth on the anterior portion of the vomer. Intermaxillary projection strongly decurved in the dried skin.

Note.—An alcoholic specimen in the Smithsonian Collection, marked 1136, is apparently that of a female of some nearly allied species, from the same general region of country. The head and skin are preserved, the flesh having been removed. In general appearance it much resembles the present species, but the spots are more numerous, and *round*—not confluent.

Salmo canis, Suckley.

DOG SALMON: SPOTTED SALMON.

Chinook Jargon, *Lekai.* Nisqually, *Thl-hwhai.*

SP. CH.—*Male.* Gape line of mouth much arched; intermaxillary protuberance well marked, decurved; fleshy prolongation beyond chin rather thick; jaws fully provided with large strong teeth, so large as to give rise to the name of *Dog salmon;* dorsal outline moderately arched; body compressed laterally, but rather deep; weight of full grown adult rarely exceeds 12 or 14 lbs. Colors, upon first arrival into fresh water, of a dingy greenish olive on the back, fading into brassy yellow on the sides, and to dingy yellowish white on the belly; sides more or less maculated with large alternate patches of dingy green, and purplish red; flesh pale and of inferior quality; upper fins and tail dark.

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* This reddish tinge on the sides and abdomen is of common occurrence in several species of salmon, when exhausted after the spawning season.

Habitat.—N. W. coast of America. Enters the streams along Puget Sound in great numbers in autumn.

All the specimens preserved of this species were unfortunately lost *in transitu.* They arrive in the small rivers and creeks, emptying into Puget Sound, about the first week in October, coming in great numbers, and remaining in the streams until about the 1st of April. They are the most inferior of all the kinds of salmon known in that region.

Note.—The foregoing notices of the new species of salmon from the western coast of America are necessarily incomplete, as but few specimens of either kind have as yet been received. More extended and useful descriptions of each will be furnished, as soon as the reception of additional material will admit. Many anatomical characteristics, such as the number of fin-rays, teeth, &c., have been omitted, owing to the imperfect condition of many of the specimens from which the descriptions were made up.

II.—*Descriptions of Several New Hymenopterous Insects from the North West Coast of America.*

By John W. Greene, M.D.

(Communicated by the Smithsonian Institution.)

Read December 6, 1858.

1. Bombus interruptus, Greene.

Muzzle yellowish; a band of black between the eyes, above which a patch of yellowish hairs, corselet yellow, a quadrangular black spot between wings; sides of the thorax covered with yellowish hair; bases of wings jet black; first, second segments, and anus black; the third, fourth, and fifth segments black, fringed with yellowish hair on the lower margins of the segments on each side; the fringes are interrupted on the dorsal aspect of the abdomen, which is of the prevailing color, smooth and shining; legs moderately hairy, reddish black; wings smoky; size, nearly that of *B. Virginicus* Fab.

Habitat.—N. W. Coast of America, Wash. Territ., Oregon.

Remarks.—The above description was taken from a specimen obtained at Fort Steilacoom, W. T., during the month of July, 1856, by Dr. George Suckley, U. S. A.

It is evidently a female, and has five abdominal segments exclusive of the anus. The yellow hairs on the thorax of one specimen in my cabinet, have a strong ferruginous tinge, but this variation is probably due to immersion in alcohol.

Another specimen, apparently a male, differs in its greatly reduced size, being about half as large, and having the dorsal aspects of the abdominal segments *hairy*, not *smooth;* in the middle, on the dorsal surface, corresponding to the bare shining interrupted space separating the lateral yellow fringes of the female, are *black* hairs, those of the sides being yellow, as in the female. It also lacks the tuft of yellow hair on the face.

2. Bombus occidentalis, Greene.

Face between the eyes yellowish, white anteriorly and laterally; first four abdominal segments black; the rest, including anus, white; length about nine lines, female.

Habitat.—North West Coast of America, Fort Vancouver, Dr. Cooper; Puget's Sound, Dr. Suckley.

Remarks.—Two specimens from the same locality present certain differences, but until I shall have had more opportunity of comparing them, they had better remain under the present head. These variations consist in their being slightly more robust in form, hairs on limbs longer, and an encroachment of the pale hairs upon the fourth segment. Male about two-thirds the size of female. The yellow hairs upon the thorax of most of my specimens are dingy, those of the muzzle much paler.

III.—*Prodromus descriptionis subfamiliæ Gobinarum squamis cycloideis piscium, cl. W. Stimpsono in mare Pacifico acquisitorum.*

THEODORE GILL AUCTORE.

Read December 20, 1858.

CHÆNOGOBIUS, GILL.

Corpus elongatum, gracile, antice subcylindricum, ad caudæ pinnam attenuatum.

Squamæ cycloidæ, plerusque parvæ.

Caput subconicum, linea frontale fere recta, superne depressum, latum, lateribus subrotundatum: vertex, opercula genæque sine squamis: dorsum antice lateribus nudis, medio squamarum fascia ab pinna dorsale ad nucham extendente.

Oculi obliqui, parvi, in capitis parte anteriore positi.

Os magnum, valde fissum, rictu pone oculos extendente, paulo obliquo. Maxillæ æquales. Lingua paulo apice emarginata.

Dentes mediocres, subcylindrici, recurvati.

Pinnæ dorsales duæ, omnino distinctæ.

P. analis p. dorsali secundæ opposita.

P. caudalis rotundata.

P. pectorales rotundatæ.

P. ventrales subparvæ, membrana interspinali haud alta.

Chænogobius annularis, Gill.

Corpus antice fere cylindricum, altitudine ad pinnam dorsalem maximo, non extremi longitudinis partem septimam æquante, duplice quam caudæ altitudo; postice compressum.

Linea ab pinna dorsali ad rostrum fere recta.

Caput læve, lateraliter semiconicum, infra pene horizontale; superne latior, depressum planumque, lente ad rostrum rotundatum coarctatum. Nucha paulo constricta.

Capitis longitudo rostro ad operculi marginem non longitudinis partem quartam formans (23–100); altitudine ejusdem fere dimidio (11–23); latitudine prope nucham multo dimidium superante (13–23).

Oculi omnino in capitis parte anteriore, orbitæ diametro fere quarties in capitis longitudine; spatio interorbitali diametri ⅜ æquante.

Pinna caudalis parva, rotundata, circa longitudinis partem sextam formans.

P. dorsalis prima radiis sex, ultimo remotiori; p. dorsalis secunda longitudinis dimidio posteriori incipiens.

D. VI. 9. A. 8. C. 19.

Color fulvus, supra dense guttulis nigricantibus minimis obscuratus, lateribus pone anum paucibus annulis fere mundis ocellos formantibus. Venter fere mundus, fulvus. Pinna dorsalis secunda trifasciata.

Hab. in sinu "Hakodadi" insulæ Japonicæ "Jesso." W. Stimpson! (specimen unicum).

LEPIDOGOBIUS, GILL.

Corpus elongatum, compressum, ad caudæ pinnam regulariter attenuatum.

Squamæ regulariter imbricatæ, cycloidæ.

Caput elongatum, subconicum, vix inflatum, vertice operculis genibusque plerumque squamosis.

Oculi fere laterales, in capitis parte mediana plerumque positi.

Os paulo obliquum rictu ad vel sub oculos extendente. Lingua apice emarginata. Maxillæ æquales.

Dentes villiformes, seriebus multis, serie externa paulo majore.

Pinnæ dorsales duæ, bene disjunctæ.

P. analis dorsali secundæ opposita.

P. caudalis margine rotundata.

P. ventrales membrana interspinali haud alta.

P. pectorales mediocres, basibus latis, marginibus rotundatis.

Ad hoc genus, *Gobius gracilis*, Girardi (post *G. lepidus* Grd.) et *G. Newberrii*, *Grd.* pertinent.

Lepidogobius gracilis, (Girard.)

SYNONYMIA.

Gobius gracilis, Grd. Proc. Acad. Nat. Sc., Philad., vol. VII. p. 134.
(non G. gracilis, Jenyns), 1855.

Gobius lepidus, Grd. Report Pacific Railroad Surveying Expedition, vol. VI, Zoology, p. 21, pl. XXV*a*, fig. 5, 6, 1853.

Corpus fulvum; membrana branchiostegalis pinnæque hepaticæ vel nigricantes.

Hab.—"San Francisco," California. W. Stimpson! October, 1855. San Francisco; Dr. Newberry! Girard.

CHÆTURICHTHYS, RICHARDSON.

SYNONYMIA.

Chæturichthys, Rich. Voyage of Sulphur, Ichthyology, p. 54, 1844.

Corpus elongatum, compressum, vix antice sub-cylindricum, ad caudam regulariter attenuatum.

Squamæ regulariter imbricatæ, mediocres, cycloidæ.

Caput subconicum, linea frontale vix curvata, antice superne sublatum. Operculis, genibus verticeque squamis obtectis.

Oculi plerumque fere in capitis parte media positi, obliqui.

Apertura branchialis magna.

Os obliquum, sat magnum, rictu paulo sub oculos extendente. Maxillæ subæquales. Lingua plerumque apice truncata.

Dentes in maxillis plerumque ordine bino, serie anteriore majores, paulo curvati vel fere subulati.

Maxilla inferior subtus barbatula (R.)

Pinnæ dorsales duæ omnino separatæ.

P. analis p. dorsali secundæ opposita.

P. caudæ lanceolata, utrinque in cauda decurrenti et ibi radiis plurimis inarticulatis simplicibusque sustentata (R.)

P. ventrales membrana connectente haud alta.

P. pectorales rotundatæ.

Chæturichthys hexanema, Blkr.

Synonymia.

Chæturichthys hexanema, Blkr. Verhandelingen van het Bataviaasch Genootschap, vol. XXV. p. 43. 1853.

Buccarum squamæ in septem seriebus; in serie longitudinale 39 plus minusve. Maxilla inferior cirris sex, oculo brevioribus, fere æquidistantibus, ultimo fere sub oculi marginem anteriorem. Pinna dorsalis prima radiis octo, omnibus fere pariter remotis.

Color fulvus, latere maculorum diffusorum quinque vel sex serie. Pinnæ obscuræ, minute guttulatæ.

Hab. in mari insulæ Japonicæ "Niphon" lateri orientali (Brooke et Kern!) Stimpson. Nagasaki, in mari, (Pflaum!) Bleeker.

Cl. Bleekeri tabulam non vidi.

IV.—*Prodromus descriptionis familiæ Gobioidarum duorum generum novorum.*

Theodore Gill auctore.

Read December 20, 1858.

Gobioidæ dentibus apicibus denticulatis, pinnis ventralibus infundibuli simplicis forma, conjunctis, maxillqaue inferiore superiore non multo minore, subfamiliam, quæ nomen Tridentigerinæ datum est, formant.

Tridentiger, Gill.

Corpus oblongum, antice subcylindricum, postice compressum, cauda alta.

Squamæ magnitudine mediocres, marginibus posterioribus pectinatis.

Caput magnitudine mediocre, superne depressum, planum, lente ad rostrum coarctatum, lateribus compressis, fere verticalibus, antice subtruncatum, rostro obtuse rotundato.

Oculi in capitis parte anteriore, fere verticales.

Os terminale, paulo obliquum, rictu ad oculos extendente: Maxillæ fere æquales, vel inferiore longiore.

Dentes in ambobus maxillis seriebus duabus ordinati; seriei anterioris dentibus elongatis, apicibus lateraliter dilatatis, plerumque paulo recurvatis, tridentatis, denticulo mediano maximo; seriei posterioris simplicibus, recurvatis.

Pinnæ dorsales duæ; prima subquadrata; secunda oblonga.

P. analis p. dorsali secundæ opposita.

P. caudalis margine subrotundato.

P. pectorales marginibus subrotundatis.

P. ventrales infundibuliformes, antice membrana junctæ.

Genus ab *Sicydio*, Val., quod *Gobio Plumieri*[*] Blochii et speciebus affinibus restrictum est, pinnarum ventralium forma infundibuliformi simplici, rostro subverticali, maxillibus æqualibus vel maxilla inferiore longiore, et dentium serie duplice, differt. Dentes tricuspidati etiam multo validiores sunt.

S. obscurum Temmincki et Schlegeli typus est.

Tridentiger obscurus (T. S.), Gill.

Sicydium obscurum, Temm. Schl. Fauna Japonica, Pisces, p. 145, tab. lxxvi., fig. 1, 1850.

Habitat in aquæ dulcis fossis Japoniæ. W. Stimpson!

TRIÆNOPHORUS,[†] GILL.

Corpus oblongum, antice subcylindricum, postice compressum, cauda alta, ad quam dorsum abdomenque lente attenuati sunt.

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[*] Sicydium Plumieri, Val. Hist. Nat. des Poissons, vol. xii., p. 168.

[†] Τριαίνοφορυς, Tridentiger; etiam Neptuni nomen: nomen dentes tricuspidatos, quasi tridentes, designans.

Squamæ mediocres, marginibus expositis pectinatis.

Caput oblongum, superne depressum planumque, triangulare, postice dilatatum, antice verticaliter truncatum, rostro obtuse rotundato.

Oculi in capitis parte anteriore positi, obliqui.

Os terminale paulo obliquum, rictu sub oculis extendente; maxillæ subæquales vel maxilla inferior paulo longior.

Dentes maxillæ superioris elongatæ, apicibus lateraliter dilatatis, paulo incurvatis plerumque, apicibus tricuspidatis, denticulo mediano maximo; maxilla inferior seriebus duabus, quarum series prima maxillæ superioris seriei similis est; series posterior dentium simplicium plerumque recurvatorum composita est.

Pinnæ dorsales duæ; secunda, quæ analis opposita est, oblonga. *Pinnæ caudalis*, *pectorales* et *ventrales* ut in genere *Tridenitgeri*, Gill.

Hoc genus *Tridentigeri* (Gill) valde affinis est, sed capite triangulari, postice inflato, et maxillæ superioris dentium serierum numero differt.

Triænophorus trigonocephalus, Gill.

Corpus sat elongatum, lente ad caudæ pinnam attenuatum, altitudine maxima circiter longitudinis extremi (pinnæ caudalis inclusæ) partem septimam æquante; altitudine prope pinnam caudalem partem decimam æquante.

Caput oblongum, superne triangulare, temporibus lateribusque postice tumidis; longitudine fere totius longitudinis partem quartam formante; latitudine maxima fere capitis longitudinis partes duas tertias æquante; altitudine multo minore.

Os rictu sub oculi margine posteriore desinente.

Squamæ in serie longitudinale 52 plus minusve.

Pinnæ dorsalis secunda analisque altæ, oblongæ, subæquales.

D. vi.—14. A. 13. C+15+ P. 17. V. I. 5+5 I.

Color fuscus, membrana branchiostegali albo punctulata. Pinna analis albo marginata. Pinna pectoralis fascia albida transversa prope basem ornata.

Hab. in portu "Hong Kong" Chinæ. W. Stimpson!

V.—*Note on the Reproduction of Individuals of the Genus* ACTINIA.

BY ARTHUR M. EDWARDS.

Read 20th September, 1858.

THE important relations that the Actiniæ bear to other classes of animals, both above and below them in the scale of life, together with the beauty of their forms and tints, have invested them with an interest to zoologists which has also been shared by unscientific persons. The attention of naturalists has thus been drawn to the fact, that a thorough knowledge of their physiology and anatomy is much needed; and it is believed that any slight notes promoting that end will be gratefully accepted by students of this class of animals.

The writer intends in this short communication to give such facts relating to the reproduction of the Actiniæ, as have come under his own observation during the past year, while keeping specimens of the British species *A. mesembryanthemum*, and *A. tigrina*, for which he is indebted to Mr. M. S. de Vere of the University of Virginia.

The writer therefore selects the following from his notes, taken at the time of the occurrence of the facts mentioned; and here he would strongly impress on all observers the value of clear and extended notes and illustrative drawings, however crude, made at the time of any observation in Natural History.

Such a record becomes, after a time, extremely useful for purposes of reference.

"I have often noticed that my specimens of *A. mesembryanthemum* have, at times, accumulations of light pink-colored granules, of from 0.025 inch., up to almost 0.05 inch. diameter, in the interior of their tentacles, and that the creatures were at these periods in a more or less contracted state, that is to say, not swollen and semi-transparent as they usually are. I also noticed that, when in this state, they exhibited an extraordinary degree of inactivity, and would scarcely clutch at the food presented to them, which at other times they would seize and devóur with great avidity. Their urtricating power also seemed to be deficient.

"Having again observed the presence of these granules in great quantity in the tentacles of one of my specimens, I watched them carefully for some time, and remarked the following facts:—

"The pink granules were seen to move up and down in the tentacles, sometimes reaching the extreme tip, and then retreating towards the body of the animal and disappearing; at other times turning at once down into the cavity, at the point where the base of the tentacle unites with the oval disc, but most frequently passing down to the other extremity near the mouth, and gradually disappearing. It at once struck me that these might be young, so I nipped one of the tentacles with a pair of forceps, when three of the granules were ejected from the orifice, situated at the extremity of the tentacle, through which the Actinia inhales the water by means of which it expands its body. The tentacle so seized was at once withdrawn, and remained contracted for some time. Two of the three granules, or, as Sir John Dalyell calls them, 'corpuscula,' dropped to the bottom of the tank, and were lost among the stones, but I captured one by means of a tube, and placed it under the microscope. It proved to be of a somewhat spherical form, and set with ciliæ on its surface, by means of which it moved about in a lively manner. These ciliæ were found to be always present up to an advanced age in the Actinia, but do not seem to have been observed in the adult animal, and are therefore most likely wanting.

"I have also had an opportunity of verifying the observations of others, that the cavity of the Actinia, which is situated between the stomach and exterior wall of the body, is provided with ciliated epithelium, for on crushing a young specimen under the microscope, epithelial scales were seen to escape, which moved about for some time by means of their ciliæ.

"By the aid of the exterior ciliæ the young Actinia moves through the water, and indeed in the interior of the parent, always progressing with the base, or rather the point at which it afterwards makes its appearance, foremost. When very young, this swimming action is somewhat quick, but as the Actinia increases in dimensions the motion becomes slower, and at last the basal disc becomes apparent. Up to this time, and even sometimes after the base is formed, the creature often adheres to foreign objects by means of its tentacles, the urticating capsules of which seem to be strongly developed.

"It is at this period of the appearance of the base, that the ciliæ, being no longer needed, most likely disappear. Food is not now required to be passed to the mouth, as the arms or tentacles appear, and the animal can search for and capture large prey,—though we often find full grown specimens, supporting themselves for months on the microscopic animals living in the water. The tentacles in *A. mesembryanthemum* make their appearance first as four, or sometimes more protuberances, and when these have reached maturity, others are added to them. The tentacles of the young animal are always longer in proportion than those of the adult.

"The normal mode in which the young Actiniæ are produced does not seem to be through the orifices at the extremities of the tentacles, or at least no one has seen them so brought forth. The natural mode is by the opening at the bottom of the stomach, and so through the mouth, base foremost. The extreme muscular contraction consequent on seizing food will sometimes eject young from the mouth, which are also at times carried back, with the food, into the stomach, but not to be digested, as the Actiniæ are not cannibal in their habits. In my opinion, all Actiniæ are normally viviparous, though Mr. Lewes mentions what he considers an example of an oviparous specimen.

"On this point, as on many others relating to the Actiniæ, much remains to be discovered, and any one possessing a few living specimens should note down facts, be they already known or new."

Since writing the above, I have found that many of the facts mentioned have been already observed by Sir John Dalyell, but he did not follow up his observations so far as I have, and therefore while I confirm some of his, several of mine herein noted down, are now, for the first time, published.

VI.—*A Comparison of the Climate, &c., of New York and Kansas.*

By Professor O. W. Morris, New York.

Read 27th December, 1858.

Much has been said of late about the climate of Kansas, as to its similarity to that of southern New York, as well as to its salubrity; and as the *Army Meteorological Journal* afforded the facilities, a comparison was instituted between them, taking the station of Fort Leavenworth, on the Missouri river, in Kansas, and of Fort Columbus on Governor's Island, in New York Harbor, as the points. Fort Columbus is in north latitude 40° 42',—Fort Leavenworth, in 39° 18', one degree and twenty-four minutes farther south, and 20° 42' west longitude from New York, and at an elevation of 873 feet above it.

The following Table shows the Mean temperature of each season, and for the year,—the Maximum and Minimum,—the prevailing Winds, and the quantity of Rain for each year, for a period of ten years,—also the same (except the seasons) for each month of the year 1854:—

TABLE.

NEW YORK.										KANSAS.								
Spring.	Summer	Autumn	Winter.	Year.	Max.	Min.	Winds.	Rain.		Spring.	Summer	Autumn	Winter.	Year.	Max.	Min.	Winds.	Rain.
51·88	72·23	54·21	29·82	52·08	92	8	N. W.	36·38	1844	55 23	73·38	51·10	30 57	52·57	91	0	N. W.	48·12
51·15	74·65	57·99	31·75	53·88	99	6	N. W.	34·08	1845	55·76	74·86	54·54	33·61	54·69	99	—14	S.	34·56
50·02	70·94	57·29	30·89	52·28	95	5	N. W.	48·91	1846	56·12	74·59	56·13	34 10	55·86	94	—6	N. W.	28·75
48·34	72·92	54·06	33·97	52·32	94	12	N. W.	64·82	1847	47·48	71·66	53·19	26·47	49 69	96	—10	S.	21·03
46·80	71·54	55·05	27·51	50·22	94	—1	N. W.	31·74	1849	54·03	73 74	57·47	23·24	52·12	90	—25	S. E.	42·85
44·90	71·24	54·43	33·14	50·93	94	9	N. W.	54·53	1850	48·10	75 74	55·27	28·67	51·94	100	—11	S.	27·07
49·02	72·69	55·80	31·07	52·15	96	4	N. W.	39·97	1851	54·19	73·25	53·78	31·15	53·09	91	—6	S.	37·81
49·62	73·19	53·67	31·84	51·40	93	—2	N. W.	43 84	1852	52 94	72·72	51·77	28·34	51·44	93	—14	N. W.	36·53
48·43	72·25	55·81	32·14	52·16	89	8	S. W.	52·20	1853	51 61	73·75	55·27	31·44	53·02	94	—8	S.W&N.W	25·20
47·07	72·42	55·24	28·13	50·71	98	11	S. W.	45·18	1854	55·55	77·71	58·57	31·53	55·84	103	—8	S. W.	24·40
48·72	73·40	55·36	31·03	51·81	93·9	4·1		45·16	Mean.	53·10	74·14	54·71	29·91	53·08	94·1	-9·7		32·13
1844	1845	1845	1847	1845					Warmest	1846	1854	1854	1846	1846				
		·58							Mean dif.	4·24	3·06		·13	1·98				
1850	1846	1852	1849	1849					Coldest.	1847	1847	1844	1849	1847				
2·53	·62								Mean dif.			2·57	4·27	·58				

MONTHLY MEANS FOR 1854.

	NEW YORK.					KANSAS.				
	Max.	Min.	Mean.	Winds.	Rain.	Max.	Min.	Mean.	Winds.	Rain.
Jan.	50	11	28·71	N. W.	2·60	67	8	24·68	S. W.	0·04
Feb.	46	14	28·17	N. E.	4·00	48	6	35·53	S. W.	1·78
Mar.	66	19	36·17	N. W.	·70	79	20	45·14	S. W.	1·33
April	76	26	45·09	N. E.	8·80	85	15	56·06	S. W.	3·35
May	80	34	59·96	S. E.	7·70	88	40	65·45	S. W.	5·55
June	88	51	68·49	S. W.	2·20	93	46	72·85	S. W.	4·50
July	93	62	75·89	S. W.	1·90	102	59	81·19	S.	·18
Aug.	90	58	72·88	S. W.	1·08	103	56	79·10	S.	1·07
Sep.	90	47	66·35	S. W.	1·90	98	47	73·71	S.	2·11
Oct.	76	36	55·71	N. W.	1·80	88	33	60·64	E.	3·30
Nov.	66	31	43·69	S. W.	3·95	68	15	41·37	N.	1·20
Dec.	43	5	27·52	N. W.	8·60	59	—7	34·38	N.	·09
Mean	72	32·8	50·71	S. W.	3·765	81·5	26·83	55·84	S. W.	2·038

The range of the thermometer in New York for 1854 is 88°, in Kansas it is 111°, a difference of 23°. The maximum at New York being 93°, at Kansas 103°—the minimum at New York 5° above, at Kansas 8° below zero.

This year, all the seasons, as well as the yearly means, are warmer in Kansas than in New York. The Spring is 8·48°—the Summer 5·29°—the Autumn 3·33°—the Winter 3·40°—and the Year 5·13°.

20·78 inches more rain fell in New York than in Kansas.

July was the warmest month in both; January was the coldest month in Kansas, and December in New York.

By this comparison it is seen that Kansas is warmer than New York. The mean temperature for the ten years was 1·22 degrees warmer. In the year 1844 the mean temperature in Kansas was 52·57, in New York 54·03—in 1854, in Kansas it was 55·84, in New York 50·71. The maximum is higher and the minimum lower there also. In 1844 the max. was 1°, and the min. 3° less in Kansas than in New York—in 1845 the max. was the same in both, but the min. was 20° lower, being 14° below zero. In 1846 the max. was 1°, in 1849 4°, in 1851 5° lower—in 1852 the same, while in 1847 it was 2°, in 1850 6°, in 1853 5°, and in 1854 10° higher. In 1844 the min. was 3°, in 1845 8°, in 1846 11°, in 1847 22°, in 1849 24°, in 1850 20°, in 1851 10°, in 1852 12°, in 1853 11°, and in 1854 19° lower than in New York.

The prevailing winds in Kansas are S. and S. W., at New York N. W. During the ten years the winds in Kansas blew on 628 days from S. and S. W., and on 618 days from N. W. at New York. Easterly winds bring the most rain in both.

The quantity of water from rain and snow is also less in Kansas. There fell in ten years at New York a mean of 45·16 inches, in Kansas 32·13 inches, a difference of 13·03 inches. In 1847 the difference was 43·79 inches, while in 1844 there was 11·74 inches, and in 1849 11·11 inches more. The greatest quantity in any one month was 15·8 inches in Kansas (June 1845), and 3·7 inches at New York. In Dec. 1845 there was *none* in Kansas, and 2·51 in New York. In April 1854 there was 3·35 inches in Kansas, and 8·8 inches in New York. The whole amount for ten years was, in Kansas 321·32 inches, in New York 451·65 inches, a difference in the whole quantity of 130·33 inches less in Kansas.

The conclusion is, therefore, that the atmospheric changes are greater, if not so sudden, in Kansas than in New York, and consequently more prejudicial to health. Its distance inland may, by causing the moisture of the atmosphere from the ocean to be precipitated before reaching there, render the air more pure as well as dry.

NOTE.—At Fort Jones, California, Lat. 41° 36′, Long. 122° 52′ W., at an elevation of 2750 feet, the temperature was for 1854—Spring, 48 58; Summer, 66·16; Autumn, 51·20; Winter, 32·65; Year, 49·65; Max., 100°; Min., 5°. At San Francisco, California, Lat. 37° 48′, Long. 122° 26′ W., at an elevation of 150 feet—Spring, 58 89; Summer, 56·40; Autumn, 57·58; Winter, 50·76; Year, 54·66; Max., 78°; Min., 27°—a very agreeable climate, with only 17 inches of rain for the year, and at Fort Jones only 29 inches.

VII.—*Remarks on certain species of North American Helicidæ.*

By Thomas Bland.

(Continued from vol. vi. p. 362.)

Read 20th December, 1858.

Helix auriculata, Say.

Synonymy.

Polygyra	*auriculata*	*Say* Nich. Enc. Am. ed.	1816
"	"	" Jl. Acad. N. S., Phila., I. p. 277.	1818
Helix	"	*Fer.* Prod., No. 98.	1822
"	"	*Binney* Bost. Jl. III., p. 384 (ex parte) Pl. xix, fig. 1.	1840
"	"	*De Kay* N. Y. Moll., p. 47, pl. 3, fig. 28.	1843
"	"	*Pfr.* Mon. Hel. I. No. 1084, excl. var.	1848
"	"	*Chemn.* ed. II. Helix p. 371, t. 65, fig. 3, 4.	
"	"	*Desh.* in Fer. Hist. p. 76 (excl. var.) pl. 50, fig. 4.	
"	"	*Binney* Terr. Moll. II. p. 186 (ex parte), pl. xl., fig. 1 (left hand).	1851
"	"	*Reeve* Conch. Icon. No. 700. excl. fig.	1852
Polygyra,	"	*W. G. Binney*, reprint of Say, p. 10.	1856
Helix,	"	" Notes on Amer. Land Shells in Proc. Acad., Phila., p. 191.	1857
		" " 200.	1858

The following is a copy of Say's description :—

Polygyra auriculata.—Shell beneath, convex; whorls five, a little rounded, crossed by numerous raised equidistant lines, forming grooves between them; spire very little raised; lateral line (extending from the outer whorl to the apex), not convex, but somewhat concave; mouth very unequal; lips prominent above, appressed to the preceding whorl beneath; pillar lip suddenly reflected, and pressed into the mouth at an acute angle, beneath very acutely concave; outer lip a little more prominent in the middle, and within the edge protruded into the mouth; throat extremely narrow; suture near the mouth suddenly reflected from the preceding whorl, and carinate; umbilicus dilated, very small within, and exhibiting a groove on the outer whorl.

Breadth of the female nearly half an inch, of the male about three-tenths. Inhabits Florida. Cabinet of the Academy. This curious species we found near St. Augustine, East Florida, in a moist situation. They were observed in considerable numbers; the color is reddish brown, indistinctly banded with whitish lines, sometimes with darker ones; mouth white.

The specimens preserved in the Cabinet of the Academy at Philadelphia, said to have been Say's, but labelled in the handwriting of Mr. Philipps, agree with those collected by Mr. O. M. Dorman, and to which I refer in these notes.

The group to which this species belongs has been very much misunderstood. In 1816 Say described *H. auriculata* and *H. avara*,—he sent specimens to Ferussac, who enumerated them in his Prodromus, and published figures in advance of the text of the Hist. des Moll., which Deshayes contributed many years later.

Dr. Binney erroneously considered *H. avara* to be the immature form of *auriculata*, and indeed referred all the forms known to him to the latter species. In 1852 Shuttleworth described Helix *uvulifera*, and Reeve published the same, with a figure, as H. *florulifera*. Of this I received specimens from Shuttleworth in 1853,—it appeared to be unknown to American conchologists. Subsequently I had a shell from Dr. Budd, without name or locality, but unquestionably the *H. avara* Say, though by no means agreeing with any species so labelled in the cabinets to which I had access, including that of Dr. Binney, in the possession of Mr. W. G. Binney.

During 1858 I received, through the kindness of Mr. O. M. Dorman, a number of *H. auriculata*, collected by himself at

St. Augustine, and several of the rare H. *avara* from the vicinity of the river St. John, East Florida. After careful examination of the whole subject, I am of opinion that *H. auriculata* Say, and *avara* Say, are entirely distinct,—that the forms referred to by Dr. Binney as *avara*, and by him, Pfeiffer, and Deshayes, as varieties of *auriculata*, are likewise distinct, and that the comparatively small shell commonly labelled *H. auriculata* in our cabinets, but generally without authentic habitat, is a variety of *H. uvulifera* Shuttl.

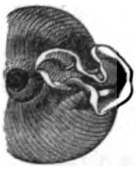
Pfeiffer in Mon. I. refers to Ferussac's figure 3 (pl. 50), as var. *minor* of *H. auriculata*, but with doubt in Mon. III. to the same, in the synonymy of *H. uvulifera* Shuttl.

Reeve's fig. 700 (pl. 119), referred to by Pfeiffer as *auriculata*, appears to be of the same form.

Deshayes gives an elaborate description in French of this species; alluding to the variety, he says: "La variété est plus petite, plus mince, plus transparente; mais ces caractères dépendent probablement de l'âge. Il en est sans doute de même relativement aux différences dans les formes et les proportions de l'ouverture." He derived and adopted, I presume, that opinion from the Boston Journal.

To aid in identifying this and the allied species, I give the annexed figure I. of the aperture of *H. auriculata* Say, double the natural size, taken from a living specimen collected by Mr. O. M. Dorman at St. Augustine.

Fig. I.



H. auriculata Say.

H. auriculata may be distinguished by its larger size, the greater development of the several parts of its curious aperture, and especially by the sudden outward deflexure of the central part of the labrum, which has a deep scrobiculation behind it, corresponding with the upper tooth within the aperture. The portion of the labium extending from the inferior angle of the parietal intruded tooth is erect, and more elevated than in any other of the species.

The following are the measurements of the largest and smallest specimens, selected from about thirty of those collected by Mr. Dorman:—

Diam. maj. 16, min. 13, Alt. 7½ mill.
" " 12, " 10½, " 6 "

I have no authentic information of the occurrence of this species in any other locality than at St. Augustine, and its immediate neighbourhood, and no other form was there found by Mr. Dorman.

It is difficult to understand Say's observation as to the different size of the male and female, referring, as he evidently does, to the shell, and not to the animal. His measurements correspond with those of the smaller diameters of my specimens. No example with the indistinct bands mentioned by Say has come under my notice.

No *fulcrum* or tubercle exists in any member of this group. The groove in the last whorl, exhibited in the umbilical region, has a corresponding somewhat convex surface in the interior.

I would explain that the forms figured as *auriculata* by Binney in Terr. Moll., pl. xl., fig. 1 (right hand), by Ferussac, pl. 50, fig. 3, and by Reeve in Conch. Icon., pl. cxix., No. 700, appear to represent the same species,—one which I consider distinct, and propose to describe as *H. auriformis.*

Binney's fig. 2 in both his works, and Reeve's pl. cxxi., No. 720, may be of a different shell, but cannot in fact be very readily made out,—the figs. 1, 2 in Chemn., pl. 55, are quite unintelligible; certainly none of them are of *H. avara* Say. To another distinct species from Georgia, confounded with *H. avara*, I give the specific name *Postelliana.*

Helix avara, Say.

SYNONYMY.

Polygyra	*avara*	*Say* Nich. Enc. Am. ed.	1816
"	"	" Jl. Acad. N. S. Phil. I. p. 277.	1818
Helix	"	*Fer.* Prod., No. 97.	1822
"	"	*Pfr. var. β. minor*, Mon. Hel. I., No. 1087 (ex parte).	1848
"	"	*Desh.* in Fer. Hist., p. 78, pl. 50, fig. 2.	
"	"	*Chemn.* ed. II., Helix, p. 370 (ex parte), excl. fig.	
"	"	*Reeve* Conch. Icon. (ex parte), No. 720, excl. fig.	1852
Polygyra	"	*W. G. Binney* reprint of Say, p. 11.	1856
"	"	" Notes on Amer. Land Shells in Proc. Acad. Phila., p. 200.	1858

Say's description is as follows:—

P. AVARA.—" Shell covered with numerous short, robust hairs; spire convex; whorls four, regularly rounded, with hardly elevated lines forming grooves, which are much more conspicuous near the mouth; mouth subreniform, two projecting, obtuse teeth on the outer lip within, separated by a deep sinus; outer lip elevated, equal, describing two-thirds of a circle; pillar lip elevated, broadly but not profoundly emarginate, concave beneath, and connected to the inner side by an elongated, lamelliform tooth, which is placed obliquely on the penultimate whorl near the middle of the mouth; lips almost equally prominent, continued; umbilicus moderate, not exhibiting the volutions, no groove on the ultimate whorl within it. Breadth quarter of an inch. Inhabits Florida. Cabinet of the Academy. Animal longer than the breadth of the shell, acute behind, above granulated and blackish, beneath, and each side, white.

" This we found in the orange groves of Mr. Fatio, on the River St. John, East Florida; it is usually covered with a black, earthy coat, which is probably retained and collected by the hairs. When unencumbered by this vesture, the shell is of a horn color. It is by no means so common as the preceding species (P. auriculata)."

No specimen of this comparatively rare shell is now to be found in the cabinet of the Academy at Philadelphia.

In the above synonymy I exclude all mention of the writings of Dr. Binney, in the confident belief that he entirely misinterpreted this species. In the Boston Journal he refers to Pl. xix. fig. 1, as the mature *H. auriculata*, and to fig. 2 "as the young shell described by Say as *P. avara.*" His remarks are repeated in the Terr. Moll., with an additional observation as to the size of the shells. From the latter work I quote the following:—

"At different periods of growth the aperture differs very much in appearance, and has led naturalists into error. When the lip is just beginning to be formed, and as yet projects but little, there are two projecting teeth on its inner edge, with a deep sulcus between them; as these continue to grow, they assume more and more the appearance of lamellar folds, the lower one of which, when viewed on a line perpendicular to the base of the shell, hides the other. The columellar fold, at the same early period, appears more like an independent tooth, to each extremity of which the lip is connected. It is this variety which Mr. Say described as a distinct species, under the name of *Polygyra avara.* This opinion I derive, not so much from his descriptions as from the examination of original specimens collected and labelled by him, now in my possession. I have specimens of the mature shell smaller than any specimen of *H. avara* that I have seen, and have other specimens of *H. avara*, so called, as large as the most mature *H. auriculata.* Plate XL. fig. 1, represents the mature shell, fig. 2, the young shell, described by Say as *P. avara.*"

The whole tenor of the above remarks is certainly erroneous. With respect to the shells "collected and labelled" by Say, it is possible that he, at a period subsequent to the publication of his diagnosis, may have distributed as *H. avara* specimens similar to those figured by Dr. Binney, considering them to be variety of that species; but the figures by no means agree with, and indeed I doubt whether he ever saw the rare form *described* by Say. There is no example of it in the cabinet of Dr. Binney, now in the possession of Mr. W. G. Binney. Through his kindness I have specimens from that cabinet of the *H. avara* Binney, which are not only mature shells, but entirely distinct from Say's species.

Dr. Binney's statement that he had the mature *H. auriculata* smaller than any *H. avara* he had seen, and the latter as large as the former in its mature state, is totally unintelligible. I can only interpret it by assuming that he did not know *H. avara* Say, and confounded a small variety of *H. uvulifera* Shuttl., and the two forms, both in fact mature shells, figured in the Terr. Moll., Pl. XL. figs. 1 (right hand) and 2, with *H. auriculata.*

To European authors *H. avara* seems to have been almost entirely unknown,—the figures in Reeve and in Chemnitz do not represent it; indeed the only figure which does so approximately is that of Ferussac.

I find from the first letter written to Ferussac by Say, a copy of which, without date, is now before me, in his own handwriting,* that he sent to Ferussac specimens of *P. auriculata* and *P. avara.* In the reply, dated Paris, 15th July, 1820, are the following notes:—

"14. *P. auriculata*, precieuse espèce que je n'avais pas, nouvelle."

"15. *P. avara*, celle-ci est presque aussi curieuse, nouvelle pour moi."

Deshayes (Fer. Hist. I. p. 78) writes as to *H. avara,* referring to Ferussac's figure, Pl. 50, fig. 2:—" Avant d'avoir vu cette espèce dans la Collection de M. de Ferussac, nous l'avions prise pour une variété de l'*H. auriculata*. Après l'avoir comparée à cette dernière, nous lui avons reconnu des caractères constants, ce qui nous a determiné à la conserver comme espèce distincte."

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* I am indebted to Mrs. Say for an opportunity of examining much of the correspondence of Mr. Say with Baron Ferussac and others, and would acknowledge gratefully the interest which she manifests in my endeavors to identify the species described by Mr. Say.

The annexed figure II. of *H. avara* Say, double the natural size, is from a specimen collected on the St. John's River, Florida, by Mr. O. M. Dorman. The *striæ* are incorrectly represented,—they should have been shown only at the termination of the last whorl, over a small space immediately behind the peristome.

FIG. II.

H. avara Say.

H. avara Say may be readily distinguished by its smaller size, more delicate texture, and less globose form,—it has from 4 to 4½ whorls, and is the only species of the group which is hirsute. The superior tooth on the labrum is armed with a hook as in the other species, but is narrower, less deeply seated, and more erect; the inferior one is rather a distinct tooth than a lamellar fold. The parietal process differs entirely from that of *H. auriculata*, as plainly shown in my figure. *H. avara* is without the groove on the last whorl which prevails in *auriculata*, and the forms represented by Dr. Binney as varieties of it.

The size appears to be constant,—the following are the measurements of the specimen figured:—

Diam. maj. 7, min. 6, Alt. 3 mill.

Mr. W. G. Binney (Proc. Phila. Acad., 1857, p. 191), when commenting on the figures of *H. auriculata* in the Terr. Moll., says: "I do not consider fig. 2, *H. avara* Say, as a variety of this, but a distinct species. There are some varieties of *auriculata* which may be confounded with it, but it is certainly a good species." I entirely agree in the opinion that fig. 2 represents a good species, but by no means that it is the *H. avara* Say. Mr. Binney mentions having received fine fresh hirsute specimens from Mr. Postell,—in this there must be some mistake. The *H. avara* W. G. Binney from St. Simon's Island and other parts of Georgia, is not hirsute, as Mr. Postell himself assures me, and *H. avara* Say has not been found there.

Helix uvulifera Shuttleworth.

SYNONYMY.

Helix *uvulifera Shuttleworth* Bern. Mittheil., p. 199, August. 1852
" " " Diag. n. Moll., No. 2, p. 19.
" *florulifera Reeve* Conch. Icon., No. 699, p. 119. 1852
" *uvulifera Chemn.* Ed. II. Helix, No. 979, t. 148, fig. 19, 20, fide Pfr.
" " *W. G. Binney* Notes on Amer. Land Shells, Proc. Phila. Acad., p. 205. 1858

Shuttleworth thus describes this species:—

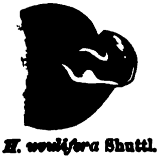
"HELIX UVULIFERA.—T. rimato-perforata, superne planiuscula, subtus inflata, striata, cinereo-albida, solidula, nitidula; anfr. 5, lente accrescentes, angusti, ultimus ad aperturam subito deflexus, subtus devius, scrobiculato-constrictus; apertura valde obliqua, auriformis, ringens, valde coarctata; perist. acutum, reflexo-patulum, marginibus plica linguiformi oblonga medio excavata profunde intrante junctis, dextro lamella profunde immersa in apicula filiformi reflexa desinente, basali tuberculo dentiformi obliquo et sinuoso instructo.

"Diam. maj. 12, min. 11, Alt. 7 mill.

"*Hab.*—In insulis parvis 'Long Keys' sinu dicto 'Sarazota,' Florida Austr. (Rugel).

"*Obs.*—Specimina numerosissima examinavi. Proxime H. auriculatæ affinis, sed textura, colore, ac apertura minus coarctata, peristomateque minus producto satis distincta. H. Ariadnæ Pfr. in Chemn., ed. 2, tab. 65, f. 29–31, etiam affinis, at differt figura testa tantum rimata sine vestigio perforationis. Nomen specificum ab apicula lamella marginis dextri peristomatis, Uvulæ Humanæ haud dissimili, assumptum. Sed character hic in omnibus speciebus affinibus plus minusve obvius est."

FIG. III.



H. uvulifera Shuttl.

The annexed figure III. of the aperture of *H. uvulifera* Shuttl., twice the natural size, is from a specimen received direct from the author of the species.

H. uvulifera may be distinguished from *H. auriculata* by the character of the labrum, which is equally produced from the superior angle of the parietal process, to the base of the inferior tooth or fold, where it is reflected, sometimes appressed to the last whorl. The lower angle of the parietal process is connected with the inner termination of the labrum by a flat, more or less developed callus. The umbilical region is less open, and there is no groove within it on the last whorl.

This species is variable in size, texture, and sculpture. Mr. Shuttleworth's specimen is opaque, of the color indicated in his description,—irregularly, and, compared with *H. auriculata*, slightly striated.

I have one example of large size, from the cabinet of the late Mr. Samuel Lounsbury, which is white, translucent, and almost smooth,—the habitat unknown.

Of the more common form, usually labelled *H. auriculata* in American cabinets, I received very many specimens from Mr. Anthony and other correspondents, but without any note of the locality in which they were collected. For one from Corpus Christi, Texas, I am indebted to Mr. W. G. Binney. This variety is of a yellowish horn color, shining, strongly striated above and at the base, and generally smaller than the shell described by Shuttleworth.

I add the measurements of the specimens referred to:—

Diam. maj. 11½, min. 10, Alt. 6 mill, whorls 5, Shuttleworth.
" " 14 " 12 " 7 " " 6, Lounsbury.
" " 9 " 8 " 5½ " " 5½, W. G. Binney.

Helix Postelliana Bland.

T. rimato-perforatâ, superne convexiusculâ, costulato-striatâ, subtus inflato-convexâ, læviusculâ; fusco-corneâ, tenui, nitidâ, subpellucidâ; spirâ vix elevatâ; anfr. 5, lente accrescentibus, convexiusculis, ultimo ad aperturam deflexo, disjuncto, scrobiculato-constricto; suturâ impressâ; aperturâ albâ, obliquâ, auriformi, coarctatâ; perist. acuto, continuo, marginibus plicâ linguiformi, oblongâ, intrante, superne excavatâ, junctis; dextro lamellâ uncatâ profunde immersâ, basali dente lamelliformi, erecto, vix obliquo, intra aperturam producto et recurvato, instructo.

Shell perforate, above slightly convex, with rib-like striæ wider apart and more prominent behind the aperture; beneath inflated, convex, almost smooth, and with microscopic spiral lines; brown horn color, thin, shining, subpellucid; whorls 5, gradually increasing, rather convex, the last deflected and turned outwards from the preceding one, scrobiculate, constricted, grooved within the umbilical region; suture impressed; aperture white, oblique, ear-shaped, contracted; peristome acute, continuous, the margins joined by a tongue-shaped fold, excavated above, entering into the aperture, the right margin having a deeply-seated lamella, which terminates in a reflexed hook, the base with an erect lamelliform, scarcely oblique tooth, produced into, and recurved within the aperture.

Diam. maj. 9½; min. 8½, mill. Alt. 5 mill.

Habitat.—Wayne Co., Ware Co. and St. Simon's Island, Ga., Postell!: Camden Co., Ga., Bishop Elliott!: Glynn Co., Ga. Wilson!

Station.—Mr. Postell writes as to the Wayne Co. specimens, of which he sent me about a dozen.

"These shells are found upon the slopes of the hills, near the base, where the earth is always moist, under fallen pines, and in most cases between the bark and trunk of the trees. The animals feed, I think, on the decayed bark, and not on living vegetable matter."

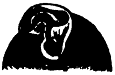
The single specimen in my cabinet from Ware Co. Ga., is somewhat larger than the others—has 5½ whorls,—the aperture is brown in color, and the striæ are more conspicuous at the base.

Its measurements are,

Diam. maj. 10; min. 9. Alt. 5½ mill.

Observations.—This species, of which the annexed fig. IV. shows the aperture, double the natural size, is certainly distinct from the three already considered. It is smaller than

FIG. IV.



H. auriculata, and the rib-like striæ, which cover the whole of that shell, are scarcely developed at the base. The form of the parietal process is very like that of *H. uvulifera*, but the continuation of its inferior angle to the inner termination of the labrum is not prostrate as in that species, but erect as in *H. auriculata.* The position and form of the upper tooth on the labrum is much the same as in that species, and in *H. uvulifera*, but the lower one is entirely different. In those it is an oblique, strongly developed, convex, sinuous fold on the margin of the labrum, not descending into the aperture, there being within a slight thickening only, corresponding with the lower exterior apertural depression.

In *H. Postellania* there is at the base of the labrum a thin, erect, oblong, lamelliform tooth, rather oblique, but more closely marginal than the fold in the other species. The exterior of this tooth is convex, within concave, it is 1 mill. in height, and 1½ in length, and descends rapidly into the aperture, where it is recurved, and terminates obtusely opposite to the lower end of the superior tooth, there being a very distinct and tortuous sinus between the two. I have opened specimens from different localities, and find these characters constant.

This is, I believe, the shell which Dr. Binney supposed to be the *H. avara* Say—specimens from his cabinet, as well as one sent to me by the late Judge Tappan, all so labelled, induce this opinion. The small figures, however, in the Boston Journal, and Terr. Moll. scarcely represent this form.

I name this species after my liberal correspondent Mr. James Postell, in acknowledgment of the valuable assistance which I have received from him, in my endeavor to elucidate the North American Helices.

Helix auriformis Bland.

Helix *auriculata Binney*, Bost. Jl. (ex parte), pl. xix. fig. 2, 1840
" " *Desh.* in Fer. Hist. var. *minor*, pl. 50, fig. 3.

Helix *avara Chemn.* ed. II., Helix 370 (ex parte), t. 65, fig. 1–2.
" " *Pfr.* Mon. I., No. 1087 (ex parte), 1848
" *auriculata Binney*, Terr. Moll. II. (ex parte,), fig. 1, (right hand), 2. 1851
" *avara Reeve* Conch. Icon. No. 720, pl. 121. 1852
" *auriculata*" " " " 700, " 119. 1852

T. rimato-perforatâ, superne depressâ, costulato-striatâ, subtus inflato-convexâ, læviusculâ; albâ vel fusco-corneâ, tenui, spirâ brevissimâ; anfr. 5½–6, planiusculis, ultimo ad aperturam deflexo, breviter disjuncto, constricto, vix scrobiculato; aperturâ subhorizontali, auriformi, coarctatâ; perist. acuto, continuo, marginibus plicâ linguiformi, brevi, intrante junctis; dextro lamellâ obtusâ, submarginali, basali tuberculo dentiformi, obliquo et sinuoso, instructo.

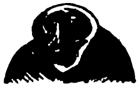
Shell perforate, above depressed, with rib-like striæ, beneath inflated, convex, almost smooth, and with microscopic spiral lines; white, or brown horn-color, thin; spire very short; whorls 5½ to 6, rather flat, the last deflected, and shortly turned outwards from the preceding whorl, constricted, scarcely scrobiculate; aperture sub-horizontal, ear-shaped, contracted; peristome acute, continuous, the margins joined by a short linguiform fold, entering within the aperture; the right margin with an obtuse submarginal lamella, and the base with an oblique sinuous, tooth-like fold.

Diam. maj. 11½; min. 10. Alt. 6 mill.
" " 9, " 8, " 4½ "

Habitat.—The largest specimen is from Ware Co., Ga., Postell! The smaller is one of two specimens found in a rotten oak log, in the neighborhood of Savannah, Ga., by my young friend, John Elliott, a son of Bishop Elliott; in these the striæ at the base are more prominent than in any other specimens. The species seems to have a wider distribution than the preceding. I have specimens from Washington Co., Texas (W. G. Binney); from Alabama (Prof. A. Winchell and J. H. Redfield) and many, without mention of habitat, from several correspondents.

Observations.—This species, the aperture of which is represented in Fig. V., is common in American cabinets, and usually labelled *H. avara*, or var. of *H. auriculata*, but it appears to me entirely distinct. It is most nearly allied to the former, but is larger, not hirsute, and has the groove in the last whorl, within the umbilical region like the latter. The parietal fold is somewhat similar to, but does not descend so far into the aperture as that of *H. Postellania*, but the teeth on the labrum are in form and position, though more developed, rather like those of *H. avara*. They are separated by the same deep sinus, but the upper one generally without the sharp reflexed hook at its termination.

FIG. V.



The pale and white varieties are, I believe, from Alabama,—my figure is taken from one of them, the shells are heavier, and the parietal fold especially is more developed.

I have given to this species the name *auriformis*, the general form of the aperture, with its several parts, offering a more striking resemblance to the human ear than is the case with any of its allies.

VIII.—*Description of a New Genus of Pimelodinæ from Canada.*

BY THEO. GILL.

Read January 31, 1859.

SYNECHOGLANIS, GILL.

Body moderately elongated and much compressed, with the back and abdomen very slowly converging to the adipose fin; caudal peduncle moderate behind the anal fin.

Head conical in profile, compressed, with the sides posteriorly sloping slightly outwards; the supra-occipital (*interparietal Cuv.*) is extended backwards in a triangular prolongation, whose apex is emarginated, and receives the point of a hastate buckler extending from the dorsal fin; the bones of the head are covered by a smooth skin through which the wrinkles of the skull are apparent.

Eyes large, and almost entirely lateral.

Barbles eight, consisting of two nasal, two maxillary, and two pairs behind the lower jaw.

Branchial apertures large and continuous under the throat.

Mouth moderate, with the gape subquadrate: lower jaw shorter than the upper.

Teeth villiform, in a broad band on both the intermaxillaries and dentary.

Tongue large, attached by the edges to the floor of the mouth.

Lateral line straight, extending to the caudal.

Dorsal subquadrate, higher than long.

Adipose fin rather small, above posterior portion of anal.

Anal rather long, decreasing posteriorly.

Pectorals triangular, with the first ray a stout spine.

Caudal forked or lunate, with the lobes equal and pointed

Synechoglanis Beadlei, Gill.

The dorsal outline declines very gradually to the adipose, and from thence rather more rapidly to the region of the caudal peduncle behind the anal fin; the peduncle is consequently quite slender.

The head is conical in profile, and of small size; it forms between a fourth and fifth of the total length from the snout to the *concavity* of the caudal fin; its greatest breadth is less than three quarters of its length. The eyes are large and oval, and the diameter of the orbit is little less than a third of the length of the head. The distance from the snout is nearly a third greater than the diameter, and the interorbital space equals a diameter.

The anterior fontanelle commences before the anterior margins of the orbits, and extends nearly to the posterior margin of the *eye;* the posterior fontanelle is nearly as long as the anterior, and is separated from it by a narrow interval.

The maxillary barbles extend beyond the anterior third of the pectoral fins, and the external barbles behind the lower jaw nearly reach to the bases of the same fins.

D. 1·5—0. A. ·28. C. 1, 7, 8, I. P. 19. V. 8.

The color of the single specimen preserved in spirits is dark olive brown on the head, and rather lighter on the back, while the sides have a silvery lustre; the abdomen is white. The anal fin and the adipose dorsal are clouded on their borders. The caudal fin is also darker at its margin.

A single specimen of this species was sent by Dr. Delos W. Beadle, from St. Catherine's, Canada West, to Mr. J. C. Brevoort, to whom I am indebted for the privilege of describing it. As it appears to be a young fish, and is, at the same time, in poor condition, I have refrained from giving a full description of it; a more detailed account may be expected in a short time.

This seems to be the only species of the genus certainly known.

A species of this tribe has been described by Franklin B. Hough, M.D., under the name of *Pimelodus gracilis*, which may be a second species of the genus. No description, however, is given of the supra-occipital, and the head is simply described as "slightly flattened, with a longitudinal depression extending from a little below the orbits to a point above the extremities of the gills." The mouth is said to be "small," which can be only applied correctly to a species of the present genus, as the true *Pimelodi* have the mouth quite large. The *P. gracilis* is described in a "Catalogue of Reptiles and Fishes from St. Lawrence Co.,"* and is stated to occur in both St. Lawrence and Jefferson counties. Its describer has evidently failed to consult the "Histoire Naturelle des Poissons," or he would have discovered that the same name had already been given to a species of South America, which has hitherto been considered as a congener of the North American *Pimelodus catus.* The *Pimelodus gracilis* of Hough is said to have from twenty-two to twenty-four anal rays, twenty-two branched caudal rays, and maxillary barbles "extending back to the tips of the gills," in which respects it differs from the present species.

IX.—*Description of Two New Species of Terrestrial Grapsoid Crustaceans from the West Indies.*

BY THEO. GILL.

Read December 20, 1858.

CARDISOMA, LAT.

1. Cardisoma diurnum, Gill.

The carapace is longitudinally arched and transversely nearly horizontal; on each side it is distinctly defined anteriorly by an elevated line which is boldly curved outwards. The sides are little convex anteriorly, but convexly tumid posteriorly. The surface of the carapace has the same order and arrangement of its areolar areas as that of *Cardisoma guanhumi* (Lat.). The postorbital tooth is elongated, triangular, and trilateral, acute and small: behind this and separated by a groove is a smaller one.

The external maxilliped has its meros or fourth joint almost obliquely truncated, cordiform, and with its internal side with a moderately gibbous margin.

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* In "Fifth Annual Report of the Regents of the University on the Condition of the State Cabinet of Natural History," &c., Albany, 1852.

The abdomen of the male is nearly similar to that of the same sex in *Cardisoma guanhumi;* its sides are slightly incurved towards the middle, and its second and third segments are broadest. The abdomen of the female is little broader than that of the male, but its sides are nearly straight and not incurved; the sixth segment is longer than broad, and the last is semi-elliptical and constricted at its base, as in that of the male.

The length of the carapace is 1·58 of an inch, and the width is 1·97.

It inhabits the islands of Barbadoes and Grenada, where it has been observed by the describer, and the island of St. Thomas, where it has been collected by Mr. Riise. It differs considerably in its habits from its West Indian congener, coming from its holes to feed in the day time, while the *C. guanhumi* is exclusively nocturnal. It dwells in holes excavated by itself, and lives in colonies like the latter species.

Its affinities appear to be rather with the *Cancer carnifex* of Herbst, or *Cardisoma carnifex* of Edwards, than with *Cardisoma guanhumi*. It resembles the former species in the angular margins of the carapace, and this peculiarity will sufficiently distinguish it from the latter; from that species, it is also distinguished by the less gibbous form of the meros of the maxilliped, and by the form of the abdomen of the female.

GENUS UCA, LAT.

2. Uca pilosipes, Gill.

The carapace is longitudinally arched and transversely moderately convex; on each side it is distinctly defined by an elevated and finely crenulated line, extending from the postorbital prominence to the region above the base of the penultimate foot. The sides are anteriorly strongly curved outwards, and from the linear carina decline inwards. The surface of the carapace has nearly the same arrangement of its areolar areas as that in *Uca una* (Lat.), but they appear to be less distinctly defined.

The postorbital angle is convex

The jugal region is granulated; the suborbital area transversely semicordate and nearly smooth; the suborbital margin is strongly crenulated.

The abdomen of the male has the sides slightly emarginate at the middle, and with the first segments laterally dilated; the last segment is semicircular; the penultimate quadrate, slightly transverse and not much longer than the fifth.

The cheliped has its meros studded with a crest of conical denticulations on its internal and inferior angles, and crenulated folds on its external; the corpus is externally convex, and has on its internal margin two approximated carinæ, the internal of which is studded with conical protuberances, and the external more or less crenulated; the hand is above crested by a row of conical teeth; below there are several very finely crenulated lines which are most distinct anteriorly.

The feet have scattered hairs on the inferior angles of their meros and the corpus and manus are densely covered beneath by similar hairs; the two last pair are comparatively naked. The feet of the third pair are longest.

Length of carapace 1·01 inch; width 1·30 inch.

The upper surfaces of the feet and chelipeds are of a beautiful pale sanguineous color.

A single specimen was present in a collection of the crustaceans of the island of St. Thomas, made by Mr. A. H. Riise. It differs especially from the *Uca una* of Latreille in the armature of the chelipeds, and by the dense hairs of the inferior angles of the feet.

X.—*Description of a New Generic Form of* GOBINÆ *from the Amazon River.*

BY THEO. GILL.

Read January 31, 1859.

Euctenogobius, Gill.

Body elongated, anteriorly subcylindrical, and thence gradually compressed towards the caudal fin.

Scales regularly imbricated and extending forward almost to the eyes; they are moderate in size on the sides, but rather small anterior to the dorsal fin; *all*, inclusive of those on the neck and back, are pectinated on their posterior margins, more or less angular near the middle, and with their surfaces sculptured with ridges diverging from the angles.

Head naked, oblong, compressed, with the profile from the eyes to the snout boldly curved.

Eyes approximated, situated mostly in the anterior half of the head.

Mouth slightly oblique, with the cleft extending more or less under the eyes.

Teeth small, in a single row in the upper jaw, and paucispiral on the lower.

Tongue laterally dilated, truncated anteriorly, and entirely attached to the floor of the mouth.

Dorsal fins entirely disconnected; the first triangular, the second oblong.

Caudal fin with a rounded margin.

Pectorals rounded or subacute, with all the rays connected by the membranes.

Ventrals with the interspinal membrane low or moderate.

This genus may very well be distinguished by the single row of small teeth in the upper jaw, and by the ctenoid scales extending on the back to within a short distance of the eyes. But few of the *Gobies*, or at least, of those inhabiting the seas of China and Japan, and of the East Indies, appear to have this plan of squamation. In most of the species of those seas, although there are ctenoid scales on the sides, the scales of the anterior portion of the back and of the nape and head, when any are present, have a true cycloid structure with a more or less eccentric nucleus. Of all the species collected by the North Pacific Expedition, fitted out by the Federal government, but a single species has the same mode of squamation as the one now described ; it is a species which appears to have been named *Gobius platycephalus* by Sir John Richardson,* and was obtained at Hong Kong, China, by Mr. Stimpson, the naturalist of the Expedition. To that species, the present writer has given the generic name of *Glossogobius.* There is little necessity of a comparison of the present genus with that one, for the similar structures of the scales on the back is the only generic character they have in common *Glossogobius* has a depressed head, protruding lower jaw, an anteriorly free and deeply emarginated tongue, and several rows of stout teeth in each jaw, the outer of which are hooked backwards. *Euctenogobius* is also well distinguished by its single row of teeth in the upper jaw; in this it differs from all the described forms; but a species obtained during the cruise of the North Pacific Expedition has the same peculiarity; it is, however, very distinct in other respects from the present, and will be hereafter described as the type of a new genus to which the name of *Synechogobius* has been given. The relations between that genus and *Euctenogobius*, are more intimate than with any others of the tribe, but *Synechogobius* is especially distinguished by the cycloid scales of the anterior portion of the back, the papillated tongue with parallel sides, and the larger teeth which are also on the margin of the jaw and not covered by the lips; the lower jaw also projects beyond the upper, and the caudal fin *appears* to have been acute or pointed. But a single species has been ascertained; its habitat is unknown, but it is probably a Chinese fish; the color is a uniform dark or brownish bay. It will be more fully described at an early date.

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* Report on the Ichthyology of the seas of China and Japan in Report of 15th Meeting of the British Association, &c., 1846, p. 204.

Euctenogobius badius, Gill.

The elongated body is slender, with the height under the first dorsal fin nearly uniform; it there equals a seventh of the extreme length inclusive of the caudal fin. With the commencement of the second dorsal, the back commences to slope downwards as far as the end of that fin; the caudal peduncle is then nearly uniform in height to the base of its fin, but near that base its dorsal and inferior margins appear somewhat inflated from the recurrence upon them of the rudimentary rays of the fin; the height of the peduncle exceeds half of that at the dorsal. The abdominal outline is nearly straight. A transverse section at the pectorals exhibits an oval or ellipse.

The scales are firmly adherent to the body; there is an average number of ten radiating ridges. The number of scales in a row along the sides is about fifty, and from the dorsal to the anus, there are about eighteen.

The head from the snout to the opercular margin, forms little more than a sixth of the extreme length of the fish. The curve from the dorsal fin to the end of the scaly area is very slight, but between the latter and the eyes there is a slight depression; the height is there somewhat more than two-thirds of the head's length. The greatest breadth equals the height at the eyes; the curve of the profile from the eyes to the snout is very oblique.

Behind the eyes, there is a slightly curved line of pores with the convexity anterior; a pore is also above each eye, and two are on the upper half of the ascending margin of the pre-operculum. There is also a diagonal line of bead-like pores on the surface of the sub-operculum, the angle of which line is at the lower part of the ascending margin of the plate.

The eye has a diameter equalling a quarter of the length of the head, and is almost entirely situated in the anterior half of the head; the inter-orbital space is only three-tenths of a diameter.

The first dorsal commences at the second-sixth of the total length.

The caudal constitutes nearly a fifth of the whole length, and when expanded its margin is regularly rounded.

The pectorals are nearly equal to a sixth of the total length; the margin is rounded and the base slightly emarginated. The rays are well connected by the membrane.

The radial formula is as follows:—

D. VI.—$1{\cdot}10^{1}_{1}$ A. 1.10_{1} G. 4, 7, 6, 4. P. 17, V. 1, 5+5.1.

The genital papilla is transversely compressed and subquadrate, and is received in a depression, so that its surface is nearly on a line with the abdomen.

The color is reddish-brown or dark bay, with a posteriorly straight hoary dot in the centre of each scale; on the back and sides above, the head is plumbeous, with two livid blue bands extending from the eye to the upper jaw. The caudal is crossed by about seven bars, which are obsolete in the membrane.

This is a species which is very easily distinguished by a certain neatness and compactness of form, and by its almost uniform color; the spots are not distinct as in many of the species which are inhabitants of the Eastern seas, but are simply manifested in obscure parallel lines. The caudal fin is alone barred; the others are almost uniform in their color.

A single specimen was obtained some years ago by Mr. A. Edwards in the Amazon river, and was presented to Mr. Charles A. Wheatley, who has placed it in the Museum of the New York Lyceum. It was given with the *Pimeletropis lateralis*, *Gill*, but it is not stated whether it was taken in company with it or otherwise; its aspect appears to indicate that it is a fresh-water fish.

XI.—*Notes on North American* CRUSTACEA, *No.* 1.

By WILLIAM STIMPSON, Corresponding Member.

Read February 28*th*, 1859.

[The materials used in the preparation of the following paper have been chiefly supplied from the Museum of the Smithsonian Institution. A large number of interesting species were contributed by Mr. Theo. Gill, who collected them in the West Indies, under the auspices of Mr. D. J. Steward.]

MAIOIDEA.

Loxorynchus grandis.

Loxorynchus grandis, Stimpson; Crust. and Echin. Pacific Coast of N. Am., p. 12; pl. xix. f. 1, and xxii. f. 1.

This is one of the largest crabs known, as it appears from a specimen collected by Dr. Kennerly at San Diego, California, where it is called "Sheep-Crab," from the woolly pubescence with which it is covered. The carapax in this specimen measures 7·34 inches in length and 5·85 in breadth.

Othonia aculeata.

Hyas aculeata, Gibbes; Proc. Am. Assoc., 1850, p. 171.

This species is not uncommon on the Florida Coast.

Epialtus affinis, nov. sp.

Epialtus bituberculatus, Gibbes; loc. cit. 173. (non M.-Edw.)

This species differs from *E. bituberculatus* in its greater breadth; the proportion of the breadth to the length in the carapax being 1:1·24. It approaches more closely to *E. brasiliensis*, Dana; but differs in its longer rostrum, and in having two small teeth on the lower edge of the penult joint in the fifth pair of feet. The length of the carapax in our specimen is 0·52; breadth, 0·42 in.

Found at Indian River, Florida, by G. Wurdemann, Esq.

CANCROIDEA.

Cancer borealis.

Cancer irroratus, Gould; Inv. Mass. p. 322.
Stimpson; Mar. Inv. Gr. Manan, p. 59.
Platycarcinus irroratus, Gibbes; loc. cit. 176.

This species is regarded by Say as the female of his *C. irroratus;* and subsequent carcinological authors have thought proper to retain his name for this rather than for the more common species, *C. sayi* of Gould, which Say regarded as the male. But the rules of nomenclature seem to require that the species to which his figure, and mainly his description correspond, should receive the name which he applied by mistake to both. The reason given by Dr. Gould for following the opposite course, viz. that Bell has figured this species as *C. irroratus*, will not hold good, since Bell's figure represents a Chilian species, *C. plebeius* of Poeppig.

C. borealis inhabits the rocks near low water mark, in the clear waters of ocean shores. It never occurs in muddy or sandy bays and harbors where *C. irroratus* abounds. It is a northern species, not found south of Cape Cod, although extending to the northward at least as far as Nova Scotia.

Actaea setiger.

Xantho setiger, Milne-Edwards; Hist. Nat. des Crust., i. 390.

Specimens from the Florida Keys are in the Museum of the Smithsonian Institution.

Actaea erosa, nov. sp.

Carapax convex anteriorly, flattened behind. The whole surface of the body and feet above and below has a deeply eroded or vermiculated appearance, being filled with small cavities, irregular in shape but nearly uniform in size. The margins of the cavities are fringed with short pubescence. The carapax is areolated, but the divisions, with the exception of the larger ones, are rendered indistinct by the character of the surface. The anterior side of the carapax is gibbous over the front, and somewhat contracted over the eyes. The two median lobes of the front are conspicuously prominent, forming rounded teeth projecting downward. Lobes of the antero-lateral margin indistinct. The surface of the ischium-joint of the external maxillipeds is marked with one principal eroded channel parallel to its inner margin, and extending the whole length of the joint. There is a notch on the anterior margin of the meros-joint of the same maxillipeds. Hands short and broad, with their outer surface divided by furrows into longitudinal tuberculated ridges; the tubercles themselves are eroded and granulated; fingers short, grooved, and 4—5-toothed within. Ambulatory feet with hairy edges; dactyli pubescent. On the first three or four joints of the abdomen the eroded cavities are transverse, and extend throughout the width of the joint. The dimensions of the carapax in a male are: length, 0·73; breadth, 1·01 inch.

This species must be closely allied to *Xantho vermiculatus*, M.-Edw.

It inhabits the coral-reefs of Florida.

Xanthodius, nov. gen.

Carapax perlatus, postice planatus, antice vix declivis; margine antero-laterali leviter quadrilobato. Palatum colliculo instructum ad marginem anticum non productum. Antennæ articulus basalis fronti v. processui frontis junctus; pars mobilis hiatum orbitæ occupans. Maxillipedum externorum merus latus, brevis, angulo externo subdilatatus, margine antico rectus. Chelipedum digiti apicibus excavati. Abdominis maris segmenta tertium, quartum, quintumque coalita.

This genus differs from *Chlorodius* in the ridge on palate or endostome. It is allied to *Xantho* and *Ozius* in the shape of the carapax.

Xanthodius sternberghii, nov. sp.

Carapax depressed, dark-reddish, distinctly though not prominently areolated; surface rugulose or as if eroded anteriorly. Antero-lateral margin somewhat acute, four-parted, teeth little prominent. At the anterior tooth the margin is blunt and rugulose. Front a little projecting, somewhat sinuous, emarginated at the middle; its lateral lobes are deflected to meet the basal joint of the antennæ. Orbits small, rounded. Chelipeds not very stout; upper margins of carpus and hand rugulose; fingers black, toothed within, and with a spoon-shaped cavity at their apices not circumscribed within. Ambulatory feet nearly smooth; dactyli tomentose. Abdomen of male narrow. Dimensions of the carapax in a male: length, 0·62; breadth, 1·05 inch.

Found at Panama by J. H. Sternbergh, Esq.

Chlorodius longimanus.

Chlorodius longimanus, M.-Edw.; Hist. Nat. des Crust. i. 401.

Florida Keys.

Menippe nodifrons, nov. sp.

Carapax narrower than is usual in the genus; upper surface areolate and somewhat nodose anteriorly. There are six knobs on the gastric region;—four in a transverse row across the middle, and two in front. There are also two knobs just above the median frontal lobes, and a large one on the hepatic region. There is a short blunt ridge on the anterior part of the branchial region, curving outward and backward to the lateral tooth. The surface between the knobs is minutely punctate. Front considerably projecting, and deeply emarginated at the middle, forming two prominent but thick and rounded teeth, between which and the angle of the orbit there are on either side two other teeth, small and tuberculiform. There is a prominent blunt tooth at either extremity of the inferior margin of the orbit; the outer one having another smaller one above it, belonging to the superior margin. Antero-lateral margin armed with four teeth besides the angle of the orbit; the teeth prominent but blunt at the tips, and not sharp-edged as in *M. mercenaria* (*Cancer mercenaria*, SAY). Chelipeds robust, microscopically granulated above. Ambulatory feet not compressed; the last three joints sparsely hairy on the sides, but densely so on the upper and lower surfaces. Abdomen like that of *M. mercenaria.* Dimensions of carap. in the male; length, 1·32; breadth, 1·90 inch.

This fine species has much the aspect of a *Xantho.* It was found at Indian River, on the coast of Florida, by G. Wurdemann, Esq. Mus. Smithsonian.

Menippe obtusa, nov. sp.

Carapax smooth and even, flattened posteriorly. Antero-lateral margins armed with four teeth resembling those of *M. mercenaria* in their proportions, but much less prominent. Front with a single tubercle only on either side of the two median lobes. Frontal region somewhat channelled along the margin above the teeth. There are two or three submarginal tubercles along the inferior side of the orbit, and a few scattered granules on the subhepatic regions. The meros-joint of the outer maxillipeds is as long as broad, pentagonal, with the antero-exterior side longest. Chelipeds very unequal in size; larger one robust; apex of carpus obtuse or truncate, not tooth-like as in allied species. The larger hand is armed with a tooth or lobe within at the base of the superior edge, and on the inner surface, near the insertion of the dactylus, there is an oval, obliquely-striated area, on which the striæ are sharp and parallel, exactly resembling those of a file. In the smaller hand, the corresponding area is covered with utriculiform granules. Ambulatory feet smooth and glossy; the last two joints only being hairy. Abdomen as in the allied species. Color of preserved specimen, reddish, mottled or banded. Dimensions of carap. in ♀: length, 1·2; greatest breadth, at the penult antero-lateral tooth, 1·7 inch.

This species has much resemblance to *M. mercenaria* in general appearance, but is easily distinguished by the smaller number of frontal teeth, and the striated area on the greater hand.

It was found at Panama by J. H. Sternbergh, Esq.

Panopeus.

The genus *Panopeus* seems to be in some degree intermediate between *Xantho* and *Pilumnus*. In our common species, *P. Herbstii*, there is a well-marked groove on the palate, indicating the efferent passage, although this is not defined by a sharply elevated ridge. The genus is peculiar to America. Certain East Indian forms which have been referred to it, prove upon examination to be generically distinct, and form a separate group, for which I have proposed the name *Heteropanope*.

The genus now contains ten species;—*P. crenatus*, M.-Edw. et Lucas, *P. lævis*, Dana, *P. chilensis*, M.-E. et L., from the western coasts of South America; and *P. herbstii*, M.-Edw., *P. texanus*, Stm., *P. wurdemanni*, Gibbes, *P. harrisii*, Stm., *P. occidentalis*, De Saussure, *P. serratus*, Des., and *P. americanus*, Des., from the eastern coasts of the United States, and the Antilles.

Panopeus texanus, nov. sp.

Closely allied to *P. herbstii*, for which it would be taken upon a hasty examination. It exhibits, however, the following distinctive characters, which are found to be constant in twenty or more specimens. The carapax is longer in proportion, and more convex; and the surface is smooth or less granulous, but generally pubescent. Hiatus of the external angle of the orbit small, being a deep notch or fissure rather than an opening. First and second antero-lateral teeth of very slight prominence. Hands large and smooth in the male, with the dactylus destitute of the strong basal tooth, which is always present in *P. herbstii* of every age. There is, also, no tooth on the hand between the bases of the fingers. The right hand is always the larger. The fingers of the smaller hand are long and considerably curved. The color of the fingers is always white or very pale brown in the male, the moveable one being generally darker than the other;—they are sometimes blackish in the female. Ambulatory feet long. The abdomen of the male is rather broad and convex, with the terminal joint transverse and broader than the penult;—thus showing a marked difference from that of *P. herbstii*. The dimensions of carap. of ♂ are,—length, 0·76; breadth, 0·97 inch. Dimensions of carapax of *P. herbstii* ♂;—length, 0·90; breadth, 1·25 in.

Found at St. Joseph's Island, Texas, by Gustavus Wurdemann, Esq.

Panopeus harrisii.

Pilumnus Harrisii, Gould; Inv. Mass. 326.

This species is smaller than *P. herbstii*. The carapax is more quadrilateral, and the upper surface transversely ridged or lineated. An important character is found in the canaliculated edge of the front, which thus seems bimarginate. The hands are longitudinally ridged above, and on the outer surface. The external hiatus of the orbit is very small, but nevertheless distinct.

This species is remote from *Pilumnus* in the want of a ridge on the palate, as well as in the presence of the external hiatus of the orbit. Gibbes' description of his *P. wurdemanni* agrees pretty nearly with it.

It has as yet been found only in the brackish waters of Charles River, Mass., near its mouth.

Eurytium, nov. gen.

This genus is proposed for the reception of the *Panopeus limosus* of Say; which is sufficiently distinct from the typical *Panopei* in its broad carapax, strong palatal ridge, and in the fact that the male verges pass under the margin of the sternum to reach the abdominal appendages, thus showing a relation to the *Ocypodoidea.*

Eurytium limosum.

Cancer limosus, Say; Jour. A. N. S., Philad., i. 446.
Panopeus limosus, M.-Edw.; Hist. Nat. des Crust., i. 404.

Common on the coast of South Carolina, in mud at low water mark. Specimens brought from Key Biscayne, Fla., by Mr. Wurdemann are larger, broader, and more highly colored than the Carolinian specimens.

Eriphia squamata, nov. sp.

Closely allied to *E. gonagra* of the Gulf of Mexico, from which it can scarcely be distinguished by any characters derived from the carapax; but the tubercles of the hands are larger, and more crowded, projecting like scales, and ciliated beneath.

Found at Mazatlan by Capt. C. P. Stone.

Lupa bellicosa (*Sloat*, MSS.).

Agrees with *L. hastata* in almost every character, except that the last two joints of the abdomen in the male are broader and more flattened.

Taken at Guaymas, in the Gulf of California, by Capt. C. P. Stone. It is the first of the *Portunidæ* discovered on our Western coast.

Lupa Gibbesii, nov. sp.

This species is intermediate between *L. sayi* and *L. spinimana.* In the characters of the antero-lateral margin, it resembles *L. sayi*, the lateral spine being at least as long as the space occupied by the four teeth in front of it. Frontal margin with four teeth nearly as prominent as in *L. spinimana*;—the sub-median tooth is, however, more prominent than in that species, though much less so than in *L. sayi.* Surface of the carapax granulated and pubescent. There are three or four naked transverse ridges or raised lines, two of which arise at the lateral spines. Chelipeds and abdomen of the male as in *L. spinimana.* Dimensions of carapax in the female;—length, 1; breadth, spines included, 2·18 inch.

Found on the coast of South Carolina, by Capt. Kurtz, and at St. Augustine, Florida, by Mr. Dorman.

Lupa spinimana.

Lupa spinimana, Leach; M-Edw.; Hist. Nat. des Crust., i., 452.
Dana; U. S. Expl. Exped., i. 273.

Found at Folly Island, on the coast of South Carolina, by Capt. Kurtz and myself.

Amphitrite depressifrons, nov. sp.

Carapax convex posteriorly and about the middle, but depressed toward the frontal and antero-lateral margins. Proportion of length to breadth, 1 : 1·49. Surface in part minutely scabrous and pubescent. Antero-lateral margin ciliated and 9-toothed, including the angle of the orbit; teeth nearly equal, the posterior one no larger than that in front of it. Median lobe of front 4-toothed, teeth about equal. Superior margin of orbit with two conspicuous fissures. The joints of the chelipeds are sharply triangular or prismatic, pubescent; meros 5-spined and ciliated in front, and armed with a single small tooth at the outer apex; carpus slender, with one long, very slender and sharp spine at the summit, and sometimes a smaller spine on the outer side; hand with a prominent superior crest, and armed with two small spines, one near the base, and one near the finger; surface of the hand minutely scabrous; dactylus ciliated above. Ambulatory feet slender; those of the first pair ciliated below; those of the second and third pairs smooth; last pair considerably shorter than the third. Abdomen of the male subtriangular, with the lateral margins somewhat sinuous. The color in our specimens is entirely obliterated. The species is described from male individuals, probably young, the dimensions of the carapax in the largest being,—length, 0·79; breadth, 1·18 inch.

It was found on the coast of South Carolina, by Capt. Kurtz, and there are specimens from the Florida Keys in the Smithsonian Museum.

OCYPODOIDEA.

Speocarcinus, nov. gen.

Carapax longitudinaliter utrinque declivis, transversim fere planus, retrorsum vix angustatus. Regio faciei dimidiam carapacis latitudinis paulo superans. Margo antero-lateralis brevis, dentatus. Oculi sat breves, corneis parvis. Orbitæ antennæque eis *Panopei* fere similes. Palatum colliculis carens. Maxillipedes externi valde hiantes, endognathi mero sat brevi, palpo endarthroideo. Chelipedes breves, crassi. Pedes ambulatorii graciles, læves, dactylis depressis, ciliatis. Vergulæ sternales. Abdomen maris ei *Panopei* simile sed ad basin sterno multo angustius, et segmentis tertio ad quinto coalitis.

This genus seems to be nearest allied to *Eucrate*, as described by Dana, from which it is distinguished by the greater breadth of the sternum posteriorly, and by the gaping of the maxillipeds.

Speocarcinus carolinensis.

PLATE I; figs. 1, 2, and 3.

Body depressed, subcylindrical. Carapax above nearly smooth; surface punctate, obsoletely granulated toward the margins; gastric region well defined; genital region depressed. Antero-lateral margin five-toothed, including angle of orbit; second tooth not distinctly separated from the first; last three teeth sharp and moderately prominent. Front about one-fourth as wide as the carapax, sufficiently prominent, straight, and emarginate at the middle. Eye-peduncles depressed and pubescent above. Chelipeds robust, nearly smooth; a strong sharp tooth or spine near summit of meros; inner margin of carpus granulated, with a blunt tooth at inner angle; outer surface of hand glabrous, microscopically granulated. Tarsi sharp; those of last pair curved upward. Length of carapax in the male, 0·88; breadth 1·09 inch.

This crab lives in the subterranean galleries excavated in the mud at low water mark by the Squilla, Callianassa, and other Crustacea, or by large worms. It is found in the harbor of Charleston, S. C.

Prionoplax spinicarpus.

Prionoplax spinicarpus, M.-Edw.; Ann. des Sc. Nat., 3me. Serie, Zool.,
xviii. 161; Archives du Mus. d'Hist.
Nat., vii. 167, pl. xi., f. 3.

Milne-Edwards gives, with a doubt, China as the habitat of this interesting Crustacean. Our specimens, however, were found at Panama, by Mr. Sternbergh, so that its geographical range must be on the tropical parts of the western shores of America.

An examination of the alcoholic specimens, in the Smithsonian Museum, enables us to determine that in this genus the male verges arise from the coxæ of the posterior pair of feet, and are lodged and concealed in the chinks separating the sternal pieces of the sixth and seventh thoracic segments. There is no ridge upon the palate or endostome.

Euryplax, nov. gen.

Carapax transverse, broad; antero-lateral margin very short, dentated; facial region of less width than the carapax; front nearly half as broad as the carapax; ocular peduncles of moderate length; external antennæ excluded from the orbit by the internal suborbital lobe, which joins the front. External maxillipeds with the palpus of the endognath articulated to the short meros at its truncated inner angle, as in the Cancroids. Palate with a distinct ridge on each side, defining the efferent channel. Chelipeds large and thick; a circular pit on the front side of the meros-joint near its extremity. Ambulatory feet compressed; dactyli of posterior pair short and compressed. Verges of the male arising from the coxæ of the posterior feet, and passing to the abdominal appendages through canals in the sternum. Basal joints of the abdomen almost entirely covering the seventh joint of the sternum, a portion of which, however, is exposed to view on each side at the lateral sinuses of the abdomen, which occur between its second and third joints. None of the abdominal segments are soldered together.

This genus differs from *Prionoplax*, *Pseudorhombila*, etc., in the characters of the orbits.

Euryplax nitidus, nov. sp.

Carapax smooth and shining, convex in a longitudinal sense. Proportion of length to breadth, 1 : 1·65. Antero-lateral margin less than half as long as the postero-lateral, and armed with three strong teeth, including the angle of the orbit. Postero-lateral margin somewhat concave. Front deeply notched on each side at the insertions of the antennæ; the inter-antennal margin straight and smooth, with no median emargination. Chelipeds robust, smooth and glossy above; meros excavated at summit, with a small sharp tooth just behind the excavation; carpus flattened above, and unidentate within; superior margin of hand almost acute; fingers somewhat deflexed. Inner side of carpus, and surface of meros around the circular pit, densely pilose. Ambulatory feet slender, those of the third pair longest. Dimensions of the carapax in a male: length, 0·65; breadth, 1·07 inch.

Found on the Florida Keys. Museum of the Smithsonian Institution.

The most remarkable peculiarity of the crab above described, consists in the existence of a circular depression at the anterior apex of the meros, concealed in the angle of the arm when retracted. This I at first considered to be accidental, or the work of some parasite; but finding it in both chelipeds, with exactly the same appearance and position, I am led to believe it to be a prominent and important character, perhaps structural, although it is difficult to say what office it fills in the economy of the animal. The aperture of the pit in our species is one-twentieth of an inch in diameter, but the cavity expands beneath the margin, which is ciliated; the depth is about half the diameter. The bottom of the pit is hard and crustaceous like the rest of the surface.

Ocypode Gaudichaudii.

Ocypode Gaudichaudii, M.-Edw. et Lucas; in D'Orbigny's Voy. en Am. Merid., Crust., p. 26; pl. xi.

Found at Panama by Mr. Sternbergh.

Gelasimus palustris.

Cancer palustris, Sloane; Hist. Jamaica.
Gelasimus vocans, var. A, De Kay; N. Y. Fauna, Crust., pl. vi., f. 10.
" " Dana; U. S. Expl. Exped., Crust. i., p. 318.
" *palustris*, M.-Edw.; Mel. Carcin., 112; pl. iv., f. 13.
" *minax*, Le Conte; Proc. Acad. Nat. Sci., Philad., vii. 408.

The following characters will serve to distinguish the present species from *G. pugilator* of all ages. The carapax is more narrowed posteriorly, and the branchial regions are less inflated. The raised lines of the anterior three-fourths of the lateral margins are more distinctly prominent. The inner side of the greater hand is armed near its postero-inferior angle with an oblique tuberculated ridge; while the portion corresponding to this ridge in *G. pugilator* is bluntly rounded. The outer surface of the great cheliped is variable in character, the tubercles being very minute or obsolete in some specimens from the Mexican and Central American shores.

This species lives in marshes, often at considerable distances from the sea, and is never found on muddy or sandy beaches, where *G. pugilator* abounds. It has a wide geographical range, having been found at Rio Janeiro by Prof. Dana, at Aspinwall by the Rev. J. Rowell, at Hayti by Dr. Weinland, on the coast of Texas by Capt. Pope and Dr. Kennerly, in South Carolina by Dr. Girard, at Old Point Comfort by myself, at the mouth of the Potomac by Mr. Stag, and in New Jersey by Maj. Le Conte and Prof. Baird.

Gelasimus pugilator.

Gelasimus pugilator, Bosc.; Hist. des Crust., i. 198.
M.-Edw.; Mel. Carcin. 113.
Le Conte; Proc. Phil. Acad. vii. 408.
" *vocans*, Gould. (non Rumph).

Found on sand or mud beaches in creeks and harbors, always near the sea. There are specimens in the Smithsonian Museum from Mexico, Texas, Florida, South Carolina and Virginia, and its range extends northward to the south side of Cape Cod.

Gelasimus subcylindricus, nov. sp.

A species of *Gelasimus* found at Matamoras, on the Rio Grande, several specimens of which were collected by M. Berlandier, and deposited in the Smithsonian Institution by Lieut. Couch, shows a close affinity with *G. pugilator* in most of its characters, but differs so much in its proportions that it will probably prove distinct. The carapax is much broader, shorter, and more convex than in the *pugilator*, and the branchial regions are more inflated.

Gelasimus panamensis, nov. sp.

Of this species there are three specimens only in our possession, all of which are apparently immature. In the largest, a male, the carapax measures 0·35 inch in length, and 0·52 in breadth. The front is prominent but broad, and rounded below as in *G. pugilator*. The carapax is broad and full behind; and the margins are sufficiently distinct nearly to the posterior extremities, but are marked by raised lines only on the anterior half. The slight oblique or curved ridge at the posterior extremity of the lateral margin is prominent, but short. The exterior angle of the orbit is acutely prominent, so that the upper margin of the orbit is sinuous. Immediately behind this angle the lateral margin is straight, or slightly concave. The adult character of the great cheliped cannot be determined from so small a specimen, but the large hand in the young is smooth or slightly granulous above, and convex and unarmed within.

Found at Panama by Mr. Sternbergh.

Plagusia sayi.

Plagusia depressa, Say; Jour. Acad. Nat. Sci. Philad., i. 100.
" *sayi*, De Kay; N. Y. Fauna, Crust., p. 16.
" M.-Edw.; Mel. Carcin., 145.
" *squamosa*, Gibbes; loc. cit. 182.

This species is distinguished from *P. squamosa* in having a series of six prominent tubercles arranged in the form of an arc across the gastric region. The corresponding tubercles may be traced in *P. squamosa*, but they are neither as prominent, nor so regularly arranged in an arcuated form. Another distinguishing characteristic may be found in the greater breadth of the superior lobe at the bases of the second and third ambulatory feet, which is regularly quadridentate.

The differences pointed out by Milne-Edwards will not serve as characters, since our species is no less tuberculose than *P. squamosa*.

Our specimens are from Key Biscayne, Florida.

Pachygrapsus transversus.

Grapsus transversus, Gibbes; loc. cit. 181.
Leptograpsus rugulosus, M.-Edw.; Mel. Carcin., 138. (?)

Scarcely to be distinguished from *P. innotatus* (*Goniograpsus innotatus*, Dana), but the carapax is somewhat more convex. The protogastric lobules are sufficiently distinct in full-grown individuals. The "corrugated area on the crest" of the hand, described by Gibbes, is sometimes obsolete.

Found among the Florida Keys by Wurdemann and Whitehurst, and on the coast of Texas by Wurdemann.

Cyclograpsus integer.

Cyclograpsus integer M.-Edw.; Hist. Nat. des Crust. ii. 79.
Mel. Carcin. 164.

In our specimen of this species the infra- or post-orbital crest is 2- or 3-lobate externally, and crenulated internally. There is an obsolete emargination on the lateral margin of the carapax at its anterior third. The surface toward the front and antero-lateral margins is minutely rugate or granulated. The male abdomen narrows toward its extremity as in *C. punctatus*. Whether these characters accord with those of the true *C. integer*, the meagre descriptions as yet published do not enable me to determine.

Found on the coast of Florida.

Sesarma cinerea.

Grapsus cinereus, Bosc; Latreille.
Sesarma cinerea, Say; Jour. A. N. S. Phil. i. 422.
" " M.-Edw.; Hist. Nat. des Crust. ii. 75. Melanges Carcinologiques, 148.
" " Gibbes; l. c. 180.

This species is broader than long, in the proportion of 1: 1·09; the breadth being measured between the orbital angles. It lives on muddy flats and the shores of creeks and sheltered harbors. Found at Galveston, Texas, by Dr. Kennerly; at Cedar Key, Fla., by A. Steele, Esq., and at the mouth of the Potomac, by Mr. Stag. It is extremely abundant near Charleston, South Carolina.

Sesarma angustipes.

Sesarma angustipes, Dana; loc. cit. i. 353. pl. xxii. f. 7.
" *Ricordi*, M.-Edw.; Mel. Carcin. 149.?

Carapax more convex and narrower than in *S. cinerea*, the width (measured between the orbital angles) being less than the length. It is, however, broader posteriorly. The front is narrower, more projecting, and often sparsely tuberculated; and the ambulatory feet are longer and narrower than in *S. cinerea*, to which this species has, in other respects, much resemblance. The dimensions of a male carapax are;—length, 0·67: width, anteriorly, 0·65; of female, length, 0·75; breadth, 0·75 inch.

I cannot certainly identify this species with *S. Ricordi*, as the description of Milne-Edwards is very short, and he does not mention the narrowness of the carapax, an important character.

In the Smithsonian Museum, there are specimens from Florida, and others collected at Aspinwall by Mr. Rowell.

Sesarma reticulata.

Sesarma reticulata, Say; J. A. N. S. Philad. i. 73, pl. iv. f. 5.
Gibbes, l. c. 180.

This species is so very different from *S. cinerea* in its thick, swollen form, and short, thick, acuminated and channelled dactyli of the ambulatory feet, that it is surprising how it could have been confounded with it by European authors. In its form, and the prominence of the epistome, it is strikingly like *Helice*, and it may probably be considered the type of a new genus.

Pinnotheres ostreum.

Pinnotheres ostreum, Say; J. A. N. S., Philad. i. 67, pl. iv.; f. 5.

The female presents the following characters:—

The meros-joint of the outer maxillipeds is naked and glossy, broadly rounded and somewhat dilated at the inner angle; and the palpus is very short, with broad joints, with the exception of the dactylus, which is extremely small and slender. The ambulatory feet of the first pair are somewhat thickened, the penult joint swollen at its extremity, and the dactylus very short, almost conical; those of the second pair are longer than the others, with a dactylus two-thirds as long as the penult joint, compressed and curved, almost ensiform; the dactyli of the posterior two pairs are compressed, but shorter and thicker than in the second pair. In the chelipeds, the inside of the fingers and part of the palm are pubescent.

The male of this species is much smaller than the female, and rarely found. I have seen but one, which was scarcely one-eighth of an inch in length. The carapax is narrower, and flatter above; the front is more protruded, larger than in the female, and separated from the rest of the carapax by a transverse sulcus.

The species is common in oysters from the coasts of the Virginian province.

Pinnotheres maculatus.

Pinnotheres maculatum, Say; Jour. A. N. S., Philad., i. 450.

Carapax in the female narrowing anteriorly, the sides being obliquely subtruncated; median regions defined by deep sutures; surface covered with a dense but very short pubescence. Front prominent, deflexed, and concave at its extremity. Meros-joint of the external maxillipeds rather smaller, but thicker and stronger than is usual in the genus; extremity of the penult joint of the palpus pointed. Dactyli of first three pairs of ambulatory feet curved, of nearly equal and moderate length; those of the last pair long.

Inhabits the coast of South Carolina.

Pinnixa cylindrica.

Pinnotheres cylindricum, Say; Jour. A. N. S., Philad. i. 452.
Pinnixa cylindrica, White; An. & Mag. Nat. Hist., xviii. 177.
M.-Edwards; Mel. Carcin., 186.

The male of this species differs considerably from the female, in its broader carapax, which is depressed or concave at the middle;—the hand is also broader, with nearly transverse fingers, and the dactylus curved, without a median tooth. These characters accord nearly with Say's description of his *P. monodactylum.* The superior edge of the meros-joint of the feet is smooth, except near the outer extremity, in all the female specimens of this species which have come under my notice, although it is stated by Say to be granulated. The palpus of the outer maxillipeds in this and the following species, is large, with the dactylus attached to the penult joint near the base of the latter, as in *Pinnotheres*, and not near its extremity as in *Pinnixa transversalis*, Lucas.

Say remarks that *P. cylindrica* is probably not parasitic. It is so however, although, as might be judged from the hardness of its carapax, it never revels like the *Pinnotheres* among the soft folds of the bivalve mollusca. It lives in the tube of a rougher host,—the *Chætopterus*, a large worm found on the coast of South Carolina, whose parchment-like sheath, expanded at the middle, is bent in the form of a semicircle, so that both extremities project to the surface of the mud.

Pinnixa lævigata, nov. sp.

Body glabrous above and below, particularly in the female. Carapax

above punctate, with a slight but sharp transverse ridge, most prominent in the male; surface behind the ridge oblique, nearly perpendicular. There is much pubescence about the bases of the feet. In the chelipeds, the fingers are longitudinal in both male and female, and gaping; the dactylus is armed with a tooth inside near the middle, and the immovable finger with a tooth near the extremity. The ambulatory feet of the third pair are very large and thick, but those of the second pair are not much larger than the first. Color yellowish grey. Dimensions of the carapax:—in a male, length, 0·22; breadth, 0·48;—in a female, length, 0·32; breadth, 0·64 inch.

This species lives with the lobworm (*Arenicola cristata*) in its hole in the sand, which is not lined by any tube. The young occur in the early spring on slimy shores at low-water mark. They were found by Lieut. Kurtz and myself near Fort Johnson, harbor of Charleston, S. C.

OXYSTOMATA.

Leucosilia Jurinii.

Guaia Jurinii, De Saussure; Rev. et Mag. Nat. Hist. 2me Ser. v. pl. xiii. f. 4.

Leucosilia Jurinii, Bell.

Found at Panama by the Rev. J. Rowell.

Randallia ornata.

Randallia ornata (Randall); Stimpson; Crust. and Echin. Pacific Coast of N. Am., p. 31, pl. xix. f. 3.

This genus is more closely allied to *Leucosilia* than any other, and is similar in the characters of the front. The external maxillipeds are not marked by a longitudinal ciliated ridge in the female; the exognath is widened at the base, and its obtuse apex is overreached by the extremity of the endognath. The pterygostomian canal over the exognath is tridentate at its anterior margin as in *Myra*.

Persephona punctata.

Cancer punctatus, Browne.
Persephona Latreillii, Leach.
" *Lamarckii*, "
Guaia punctata, M.-Edwards; Hist. Nat. des Crust. ii. 127.
" " Gibbes; loc. cit. 185.
Persephona guaia, Bell.

Common on the shores of Florida and South Carolina.

Persephona Edwardsii.

Persephona Edwardsii, Bell; Lin. Trans., xxi. 294; pl. xxxi. f. 8.

Found at Panama by the Rev. J. Rowell. Bell's specimens were from the Galapagos Is. In our examples from Panama the latero-inferior surfaces of the body, and the lower edges of the feet, are pubescent. Color in recent alcoholic specimens, above red, bluish white below.

Hepatus angustatus.

Hepatus angustatus, (Fabr.) White; Cat. Brit. Mus. 1847, p. 46.
" " Dana, loc. cit. i. 394.
Hepatus faciatus, Latr.: M.-Edwards.

Brought from Aspinwall by the Rev. J. Rowell.

Hepatus decorus.

Cancer decorus, Herbst.
Hepatus decorus, Gibbes; loc. cit. p. 183.

Taken at St. Joseph's Island, Texas, by G. Wurdemann, Esq. *Hepatus tuberculatus* of De Saussure should be compared with the young of this species.

Calappa marmorata.

Calappa marmorata, Fabr.; Suppl. 346.

We have specimens from Pensacola and from the Tortugas, Florida.

Calappa galloides, nov. sp.

Very closely allied to *C. gallus* of the Pacific, but is less convex, and less strongly tuberculated. The front or rostrum is distinctly quadridentate.

Inhabits the Florida Keys. Museum of the Smithsonian Institution.

DROMIDEA.

Dromidia* Antillensis, nov. sp.

Body everywhere short-pubescent, with longer hairs on the sides and on the feet. Carapax somewhat longer than broad, strongly convex, smooth. Frontal region longitudinally grooved along the middle. Front strongly deflexed and five-toothed (supra-ocular teeth included); teeth small and slender, almost spiniform, horizontally projecting; the median three sub-equal, and about as long as the distance between them at their bases; teeth over the eyes shorter but acute. External angle of the orbit prominent but obtuse. Lateral margin of the carapax four-toothed, and deflected anteriorly toward the corners of the buccal area, where there is a tubercle. First three teeth of lateral margin subspiniform; posterior one, situated at the lateral sulcus, as large as the others but less acute. External maxillipeds elongated; meros large, longer than the ischium, with its antero-exterior corner prominent, forming a sharp right angle. Chelipeds rather short and stout, nearly smooth; inferior edges of ischium and meros-joints granulated; carpus dentated at anterior angles with small teeth; hand short, smooth externally; palm shorter than dactylus, and armed with two or three small spiniform tubercles on the basal half of its superior margin. Ambulatory feet rather slender, smooth. Last pair of feet much longer than penult pair. Penult joint of abdomen in the male elongated and slender; terminal joint longer than broad; none of the joints soldered. Length of carapax, 1·30; breadth, 1·28 inch.

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* The diagnoses of this and the succeeding new genera of Anomoura will be found in the Proceedings of the Philad. Acad. Nat. Sciences, Dec. 1858.

It carries a covering which is usually larger than itself, and may be either a compound ascidian, or a zoanthoid polype.

Found at St. Thomas, by M. Riise; at Key Biscayne, Florida, by G. Wurdemann; and at the Tortugas, by Dr. Whitehurst.

It appears to be a common species, and I have seen it in most cabinets labelled *D. lator*, M.-Edw. That species, however, belongs to Milne-Edwards' first division, in which the carapax is broader than long.

Hypoconcha arcuata, nov. sp.

Front margin of carapax regularly arched, nearly semicircular in outline; much more broadly rounded than in *H. sabulosa*, Guerin. There are slight notches on this margin at the insertion of the antennæ, but no notch at the middle, where there is, however, a deep fissure. The front margin is also minutely spinulose and densely ciliated, but not sparsely toothed as in Guerin's species. The lower surface of the facial region, maxillipeds, and chelipeds are everywhere uniformly granulated; but the granules of the chelipeds are rather finer than those of the facial region. The fingers are toothed, but the teeth are much shorter than in *H. sabulosa*. The last two joints of the female abdomen are minutely granulated, but not tuberculated. Length of carapax in the female, 0·235; breadth, 0·257. In one specimen the dimensions were nearly twice as great.

Found on the sandy shores of South Carolina, by Lieut. Kurtz; and at St. Thomas, by A. H. Riise.

The genus is a remarkable one, and was first instituted by Guerin, in 1854, for the *Cancer sabulosus* of Herbst, known to travellers, more than a century ago, as the "Faux Bernhard l'Eremite." Its dorsal integument is not indurated, but membranaceous, and the animal consequently carries a valve of some *Venus* or other bivalve, which serves it both for a protecting covering and a hiding-place. Guerin says that the shell is held on by the posterior four feet, but the abdomen seems to serve this purpose more fully, by being abruptly bent and projecting near the middle, fitting firmly into the dorsal or hinge-sinus of the shell.

PORCELLANIDEA.

Petrolisthes sexspinosus.

Porcellana galathina, Say; Jour. Acad. Nat. Sci. i. 458 (vix Bosc.).
Gray; Zool. Misc. 14.
Porcellana sexspinosa, Gibbes; loc. cit. 190.

Found in considerable numbers on the Florida Keys, by Wurdemann and Whitehurst.

Petrolisthes occidentalis, nov. sp.

Scarcely to be distinguished from *P. sexspinosus*, but the carapax is slightly broader, the spines less prominent and less acute, and the abdomen and feet more pubescent. To establish these differences with certainty, however, the examination of a large number of specimens is necessary.

Found at Panama, by Messrs. Sternbergh and Rowell.

Petrolisthes armatus.

Porcellana armata, Gibbes; loc. cit. 190.

The outer edge of the hand in this species is generally smooth, as the marginal spines mentioned by Gibbes, rarely occur.

Found at Aspinwall, by Mr. Rowell, and in great abundance at St. Thomas, by Riise.

Specimens were taken at Panama by Messrs. Sternbergh and Rowell, of a species which is either identical with *P. armatus*, or so closely allied that I have as yet been unable to find the distinctive characters.

Petrolisthes politus.

Porcellana polita, Gray; Zool. misc. 14. Griffith's Cuv. Crust. 312. pl. xxv. f. i.
" *magnifica*, Gibbes; loc. cit. 191.

Barbadoes; (Gill;) St. Thomas; (Riise.)

Petrolisthes marginatus, nov. sp.

This species is allied to *P. armatus*, but the median lobe of the front is smaller and more prominent, and the carpus shorter; also there are four teeth, equal in size and very sharp, on the anterior margin of the carpus of the left cheliped. The surface of the carapax is smooth and pubescent. The hands are granulated, and covered above with a very short but dense pubescence;—from the inner base of the finger to the anterior angle of the carpus there extends a ridge of moderate prominence. The anterior or front margin of the hand is regularly small-tuberculated or crenulated, and the margin is conspicuous from the fact that the tubercles are of lighter color than the rest of the hand;—beneath there are two rows of marginal granules. The meros-joint of the ambulatory feet is spinulose above, and 1-spined below, near extremity. Color a deep purplish-crimson. Dimensions about the same as those of *P. armatus;* length of carapax about half an inch.

Found at Barbadoes, by Mr. Gill.

Petrolisthes gracilis, nov. sp.

Carapax smooth, unarmed, and shaped as in *P. rupicolus*, but more flattened, and with a less depressed front. Chelipeds long and slender;

carpus narrow, about three times as long as broad, with its anterior and posterior margins parallel, straight and smooth, the posterior margin projecting and forming a sharp tooth at its outer extremity. Hands smooth, microscopically granulated; fingers within or below hairy. Ambulatory feet with the meros twice as long as broad, not dilated towards its extremity, and smooth, without spines above. Color reddish. Length of the carapax, 0·44; breadth 0·41 inch.

Taken at Guaymas, in the Gulf of California, by Capt. C. M. P. Stone.

Petrolisthes tridentatus.

Plate I. fig. 4.

In this small species the carapax is smooth and unarmed. Front much deflexed and tridentate; with the median tooth or lobe triangular; margins smooth. The teeth of the front are most distinctly seen in a front view. Feet nearly naked. Chelipeds obsoletely granuloso-squamose; carpus about twice as long as broad, with the anterior margin nearly straight, not toothed, and very slightly projecting at the inner angle; the posterior margin subsquamated, but not spinulated. The carapax is generally minutely spotted with red, and streaked down the middle with whitish. Chelipeds dark reddish. Ambulatory feet annulated. Length of carapax, 0·20; breadth, 0·19 inch.

Found at Barbadoes, by Gill, and at St. Thomas by Riise.

Gray's short description of his *P. affinis*, (for which no locality is given,) applies in most respects to this species, and may be the same.

Pisosoma Riisei, nov. sp.

Carapax rounded, smooth, and glabrous, faintly punctate and obsoletely striated transversely. Front bi-marginate; the upper margin or crest straight; the lower margin projecting into a small triangular tooth placed nearly in a vertical plane. The last three joints of the ambulatory feet are hairy; the meros-joint not dilated, and with smooth margins. The chelipeds are unfortunately missing, but they are probably short and thick, as in *P. pisum.* Length of carapax, 0·17 inch; breadth a little greater. In this pretty little species the carapax is of a bright crimson color, with a large white spot on either side of the front; the ambulatory feet crimson, broadly 2- or 3-annulated with white.

Taken at St. Thomas, by A. H. Riise.

Pachycheles rudis, nov. sp.

Plate I. fig. 5.

Carapax, antennæ, etc., nearly as in *P. grossimanus.* Sinus of posterior margin deep, almost acute at the middle. Surface glabrous, obsoletely granulated, punctate or striated in different parts. Chelipeds very unequal, with a rugose, uneven surface above, irregularly tuberculated and granulated; carpus very short, angular, and projecting in front, but not dentated, convex at the posterior margin; surface of the carpus strongly granulated, with two longitudinal rows of more prominent granules near the middle; hand subtriangular, with very uneven surface, and a strong protuberance near the middle; lower surface of the hand glossy and slightly granulated in the middle, but more strongly granulated toward the margins; no pubescence between the fingers; surface of the fingers like that of the palm. Length of the carapax (along median line) in the male, 0·43; breadth 0·46; length of greater hand, 0·58; breadth 0·36 inch.

A littoral species like others of the genus. Inhabits the coast of California. Found at Monterey by A. S. Taylor, Esq., at San Luis Obispo by Dr. Newberry, and near San Francisco by Dr. Trask.

Megalobrachium granuliferum, nov. sp.

Sides of the body densely hairy both above and below the bases of the feet. The feet are also hairy. When the chelipeds are folded, the tips of the fingers do not touch each other. The color is whitish where not concealed by sordes; with scarlet patches on the margins of the median region of the carapax, and on the upper sides of the hands.

Carapax convex, smooth at the middle, but uneven and rugate towards the sides. Front of gastric region protuberant. Frontal region much depressed. Front tridentate, teeth however but little prominent; margins tomentose. Chelipeds large, resembling in shape those of *Polyonyx macrocheles*, but rugose, strongly granulated above and longitudinally bi-sulcated, dividing the surface into three equal obtuse ridges; meros very large, not dilated at anterior angle; carpus longer than broad, with entire margins, front margin not dilated, posterior margin arcuated; hand short, triangular, much narrowed behind, summit at juncture of finger very prominent; surface of hand more deeply sulcated than that of carpus, and outer margin hairy; fingers gaping, hairy above, crossing each other at tips; dactylus rather longer than the palm. Length of carapax, 0·29; breadth, 0·29; length of meros joint of greater cheliped, measured on lower side, 0·15; length of carpus, 0·22; of hand, 0·44, inch.

Found in considerable numbers at Barbadoes by Mr. Gill, and at St. Thomas by A. H. Riise.

Porcellana ocellata.

Porcellana ocellata, Gibbes; loc. cit. 190.

Specimens of this species are often rather reticulated than ocellated. The hand is very broad, and strongly arcuated in the outer margin. In one of our specimens the carapax measures 0·70 inch in length, and the same in breadth.

Florida Keys; (Wurdemann.) St. Thomas; (Riise.)

HIPPIDEA.

Albunæa Gibbesii, nov. sp.

Plate I., fig. 6.

Albunæa symnista, Gibbes; (non Fabr.) loc. cit. p. 187.

Carapax broader than long, and considerably broader than in *A. symnista*. Ocular peduncles elongated, sharply triangular as in *A. Paretii;* their inner edges straight; their outer edges scarcely at all convex. Anterior margins on each side denticulated with six or eight teeth, variable in size, sub-distant and rather short. The tooth or spine, at the antero-lateral angle, reaches forward but little beyond the level of the anterior margin of the carapax, and is far shorter than in *A. Lucasii.* Dactylus of fourth pair of feet with no projecting lobe at the superior base; extremity acute, not rounded as in *A. symnista.* The terminal joint of the abdomen, in the male, is narrow, and acuminate, its extremity forming a long narrow projection, equalling one-fourth the entire length of the joint. This projection and the lateral margins of the joint are soft and flexible. On the surface of the joint there is a thick longitudinal tuft of longish setæ on either side of the median line, also a very thick tuft or pencil on each side at the base. Length of carapax in the male, 0·95; breadth, 1·10 inch.

This large species resembles *A. Paretii* in its front and eyes, but differs much in the characters of the last joint of the male abdomen.

Found at St. Augustine, Fla., by J. C. H. Smith, Esq. It also occurs among the Keys, near the southern extremity of Florida.

Lepidopa scutellata.

Albunæa scutellata, Desm.; Crust. p. 173.
" " M.-Edw.; Hist. Nat. des Crust. ii. 204.
" " Gibbes; loc. cit. 187.

Inhabits the shores of the Island of St. Thomas;—A. H. Riise.

Lepidopa venusta, nov. sp.

Carapax glabrous, of a silvery hue with bluish reflections in specimens preserved in spirits. The markings of the dorsal surface of the carapax are less profound and less numerous than in *L. scutellata*, and the principal transverse sulcus is nearly straight, and not undulated as in that species. Front tridentate; lateral teeth situated at about half-way between the median one and the lateral angles, and consequently nearer the median one than in *L. scutellata*. Ocular peduncles large, oval, diverging, and a little thickened below along the middle;—the minute eye being situated on the inferior surface near the extremity. Antennulæ slender, with flagella more than five times as long as the carapax. Feet nearly as in *L. scutellata*, but the dactylus of the second pair is more sharply excised, and the dactyli of the following pairs are more slender.

Length of the carapax, 0·43; greatest breadth, 0·54.

Found at St. Thomas by A. H. Riise.

LITHODIDEA.

Echidnocerus foraminatus.

Body depressed. Upper surface of carapax and feet sharp-tuberculated, and minutely setose as in *E. cibarius*. Carapax subpentagonal, with the sides more sinuated in the hepatic and branchial regions.

Rostrum short; superior part with six short spines; inferior spine slender and acute, curved upward, a little overreaching the eyes. The antennæ are very short, and the acicle has five or six spines on each side. Feet short, and almost exactly like those of *E. cibarius*, except that in the chelipeds, the carpus has below a deep smooth sinus, and the carpus-joint of the second feet a corresponding sinus, somewhat shallower, however;—when the feet are folded these sinuses, coming together, form on each side of the body a round hole half an inch in diameter. Something of the same kind, but very much smaller and not at all conspicuous, is seen in *E. cibarius*. It probably serves for the passage of water to the gill-openings, which would otherwise be somewhat obstructed by the close folding of the chelipeds against the facial region.

The above description is drawn up from a specimen sent me by Dr. Trask of San Francisco. The dimensions of this are—length of carapax, 5·20; breadth, 6·10 inch.

Two examples of this species are in the possession of its discoverer, Dr. Trask, both of which were taken off the coast of California, near San Francisco.

Phyllolithodes papillosus.

Phyllolithodes papillosus, Brandt; Bulletin phys.-mathem. de l'Academie de St. Pétersb. 1849, vii. 175.

Petalocerus Bellianus, White; Proc. Zool. Soc., 1856. p. 134. pl. xlii.

Mr. White's figure of this species having been published, there is no longer any doubt that his species is identical with that of Brandt. His description of the abdomen of the crab is rather "curious" than satisfactory.

Found in the stomachs of percoid fishes ("Cabesones") taken off Monterey, Cal., by Mr. Taylor.

Hapalogaster cavicauda, nov. sp.

Plate I., fig. 7.

Body, feet, and abdomen thickly short-setose above. Carapax subcordate, much depressed, nearly smooth, somewhat roughened or granulated at the insertions of the setæ. Sutures as in *H. dentatus.* Anterior margin five-toothed; median and lateral teeth equally prominent and sharp; teeth just within lateral teeth, small but sharp. No teeth or spines on the lateral margins, with the exception of the two on each side near the middle, at the origins of the sutures. Antennæ as long as the carapax; flagella very slender. Chelipeds thick and strong, but depressed, of the same size and shape as in *H. dentatus,* but smooth, and without tubercles, like the carapax; front margin of meros strongly bidentate; carpus with a tooth at the inner extremity of its anterior margin; margins of hand smooth. Ambulatory feet broad, much depressed, smooth; their anterior margins densely ciliated and deeply incised, forming four or five closely approximated teeth on each joint. Abdomen short, very broad, depressed, folded abruptly upon itself at the third segment and soldered, so that the three joints above next the base are convex, and setose in short fascicles; but the terminal joints below are concave, coriaceous, not setose, and have the segments distinct. The calcareous plates upon the first segment above are small, elongated, widely separated, and have no median plate between them. The plates of the abdomen are thus somewhat like those of *Dermaturus,* but the outer maxillipeds are exactly as described by Brandt for his genus *Hapalogaster.* The chelipeds are without spines, as in *H. Mertensii.*

Brandt, in his diagnosis of the genus, says that the carapax is somewhat leathery, and but little indurated with calcareous matter, but in the present species, as in the *Lomis dentata* of De Haan, which we have referred to the same genus, the carapax is as hard as is usual in crustacea.

The length of the carapax in our species is 0·72; breadth, 0·83 inch.

It was found at Monterey, Cal., by Mr. A. S. Taylor.

PAGURIDEA.

Cenobita rugosa.

Cenobita rugosa, M.-Edw.; Hist. Nat. des Crust. ii. 241.
Dana; loc. cit. i. 471. pl. xxx. f. 1.
Cenobita clypeata, Owen (non Latr.); Beechey's Voy. Zool. 85.

Found at Panama by Messrs. Sternbergh and Rowell.

Cenobita diogenes.

Cenobita diogenes, Latr.
" " M.-Edw.; Hist. Nat. des Crust. ii. 240.

Found at Barbadoes, by Mr. Gill; St. Thomas, Riise; Hayti, Dr. Weinland; Florida, Bartlett.

Pagurus venosus.

Pagurus venosus, M.-Edw.; Ann. des. Sc. Nat., Ser. 3me., x. 61.

This species may be distinguished from others of the same group by the character of the third foot of the right side, which is exteriorly somewhat flattened, and transversely striated like that of the left side, though in a less degree. It is about four inches in length, and of a scarlet color, partly reticulated with deeper crimson threads or veins.

Found at St. Thomas by A. H. Riise.

Pagurus sinistripes, nov. sp.

Lateral margins of anterior part of carapax spinulose, especially at the anterior corners. Upper surface sparsely provided with fascicles of setæ toward the sides. The teeth or points of the front between the bases of the eyes and antennæ are large and triangular. The interocular plate or bracteole is colorless, and hence not conspicuous. Eyes large and thick, shorter than peduncle of antennæ; cornea considerably swollen, and bearing a tuft of hairs in its superior notch. Ophthalmic scale obtusely-triangular, four-spined and somewhat setose at apex. Acicle of antennæ very slender, setose, not spinulose, and shorter than the eyes. In the left cheliped the carpus is spinulose, with four larger spines on the superior edge, that next the hand smallest; hand very thick, surface granulato-squamose, the squamæ often spinulose and setose; no hair on the hand excepting a little on the inner side; fingers armed within each with four or five strong but depressed molar tubercles; tips of fingers corneous, excavation small; exterior surface of dactylus sharply tuberculated. Smaller hand hairy, spinulose above, and depresso-tuberculated on the outer side. Second and third pairs of feet hairy and spinulose above; dactyli with tufts of hairs arranged in longitudinal series. The last two joints of the left foot of the third pair are flattened, or somewhat excavated on the outer side; this surface is divided along the middle by an obtuse carina, and transversely striated, the striæ setose; superior margin armed with black-spinules; inferior margin with subspiniform tubercles. The scabrous disc of the hand in the 4th pair of feet is elongated, elliptical, almost acute at either extremity. The false feet of the male abdomen are slender. Length three inches. Length of carapax along median line, one inch; breadth of front, 0·42 inch.

Found at Panama by the Rev. J. Rowell.

Aniculus elegans, nov. sp.

Median areolet of the gastric region rhomboidal, broader than in *A. typicus*, and with its two anterior sides longest and straight. Frontal sulci occupied by a dense pubescence. Rostral tooth or point regularly triangular. Ophthalmic scales triangular, with an acute apex, and entire margins. The under side of the meros and carpus joints in the chelipeds is setose, but not tuberculated as in *A. typicus*, and the margins of these joints are pectinated with black spinules. Length five inches.

Found at Panama by the Rev. J. Rowell.

Calcinus obscurus, nov. sp.

This species has smooth chelipeds, and is closely allied to *C.*

tibicen,—differing only in color and in its somewhat more elongated hand. The greater cheliped is everywhere reddish-brown, with the exception of lighter margins to the fingers. The ambulatory feet are dark-olive, almost black, and their terminal joints are annulated near the tip, and sometimes also near the base, with a reddish ring.

This species might be referred to *C. chilensis*, with which it agrees in the length of the eyes, etc., but that species is in Gay's Hist. de Chile, Zool. iii. p. 191, said to have "varios tuberculitos sobre las pinzas y la parte vecina de la mano."

Collected in considerable numbers at Panama by Dr. Suckley.

Clibanarius vittatus.

Pagurus vittatus, Bosc.; Hist. des Crust. ii. 8. pl. xii.
Gibbes; loc. cit. 189.

Hands equal. Ambulatory feet 8-striped longitudinally; with dactyli longer than the penult joint.

Found at the mouth of the Rio Grande by Dr. Berlandier; at St. Augustine, Fla., by Mr. Dorman; and is common at Charleston, S. C.

Clibanarius panamensis, nov. sp.

Of the same size with *C. vittatus*, to which it is very closely allied and perhaps identical; differing but little except in the arrangement of the colors in the longitudinal vittæ of the ambulatory feet. The white vittæ are more regularly arranged, equidistant, and more distinct on the inner sides of the feet. There are also more numerous stripes on the meros joint. Lastly, the tubercles of the hands are somewhat more sharply prominent.

Panama. Mr. J. H. Sternbergh.

Clibanarius sclopetarius.

Cancer sclopetarius, Herbst; Naturg. der Krabben und Krebse, ii. 23. pl. xxiii. f. 3.

Pagurus cubensis, De Sauss., loc. cit. p. 39.

Another species very near to *C. vittatus*. The dactyli of the ambulatory feet are somewhat shorter, and the stripes of color are equal, less distinct, not marginate, and rather yellowish than reddish.

Found at Aspinwall by Mr. Rowell; at Trinidad by Mr. Gill; and at the Tortugas by G. Wurdemann.

Clibanarius Antillensis, nov. sp.

Length about one inch. Eyes slender, very long, longer than either the peduncle of the antennæ, or the width of the front. Ophthalmic scale large, broad and truncated, spinulose on the front margin. Chelipeds nearly equal (the right usually the largest), armed with short spines or sharp tubercles, and somewhat hairy; hands olive, tubercles white. Ambulatory feet stout, very hairy above; dactyli much shorter than the penult joint. In the third foot of the left side the penult and terminal joints are flattened. The ambulatory feet are olive, with one white stripe on each side;—meros-joint with two stripes.

Differs from *C. bicolor* in its coloration. From *C. brasiliensis* in its larger ophthalmic scales, its right third foot not flattened, and in its more spinous hands. From *C. æquabilis* in its hairy and vittate feet.

Barbadoes; Theo. Gill, Esq.

Isocheles wurdemanni, nov. sp.

Body everywhere densely hirsute with long fine hairs. Post-frontal transverse sulcus deep, W-shaped, and placed more posteriorly than in *I. æquimanus*. Median point of front very obtuse, very little prominent, less so than the lateral points, which are acuminated. Eyes long, somewhat compressed, with a reddish vitta above; cornea very small. The eyes reach beyond the middle of the terminal joint of the peduncle of the external antennæ. The acicle is hairy, rough with spiniform points, and does not reach to the tips of the eyes. Chelipeds tuberculated above, and sparsely hairy; tubercles rather sharp, the larger ones arranged in longitudinal rows; carpus with a broad longitudinal channel between two rows of tubercles above, tubercles of the marginal row spiniform; fingers with strongly and densely tuberculated surface, somewhat gaping within, and dentated with equal tuberculiform teeth; tips corneous, sharply prominent. Feet of the second and third pairs subcylindrical, roughly granulated; dactyli not compressed, with six or seven slightly prominent, longitudinal, crenulated, and hairy costæ. Hand of the fourth pair of feet oblong; dactylus slender, not compressed, and scarcely over-reaching the tip of the rounded thumb-like process of the hand. Abdomen thickly covered with long hair; terminal joint scarcely emarginated. The chafing areolæ or callosities of the inferior surfaces of the feet near their bases, are numerous and well-marked. Length about 2¾ inches. Length of carapax, 0·72; breadth posteriorly, 0·65; breadth of front, 0·28; length of chelipeds, 1·10; of ambulatory feet, 1·75 inch.

It is allied to *I. æquimanus*, but the hands are more strongly tuberculated, and the tarsi are not compressed as in that species.

Found in the Gulf of Mexico, at the mouth of the Rio Grande, by G. Wurdemann, Esq., whose extensive and long-continued researches in the zoölogy of our southern coast have furnished us with many interesting novelties.

Paguristes turgidus.

Clibanarius turgidus, Stimpson; Crust. et Echin. Pacific Coast of N. Am., p. 44; pl. xxi. f. 1.

The anterior or gastric portion of the carapax is fasciculated with hairs towards the sides, and bears a single tuft in the median line. The anterior cardiac lobe is elongate-triangular, slightly convex near the base, but not dilated toward the pointed extremity. Rostriform tooth very short, and not more prominent than the lateral points, which are acuminated. Eyes slender, but much shorter than the width of the front. Ophthalmic scales with an elongated apex, denticulated on both margins. Acicle falling short of the extremity of the eye by one-sixth of the length of the eye;—it is hairy and spinose on both sides. Chelipeds equal. Terminal joint of abdomen unsymmetrical, with the left terminal lobe much more produced than the right. The callosities of the inferior surface of the thoracic members are numerous, large, black, and well defined.

Inhabits the western coast from Puget Sound to Monterey, Cal.

Paguristes depressus, nov. sp.

Carapax flattened, naked; posterior portion much expanded; sides of anterior portion short, the transverse suture reaching far forward laterally; surface rugulose; lateral sinuses spinulose. Anterior cardiac lobe narrow-halberd-shaped, somewhat widening toward its blunt posterior extremity. Rostrum elongated, reaching nearly to the middle of the ophthalmic scales, with its lip imbedded in the rounded tubercle of the ophthalmic ring, which is exposed in this species. Eyes very large, much over-reaching the tip of the peduncle of the very slender antennulæ. Ophthalmic scales with bidentate tip,—margins of apex entire. Antennæ short; terminal joint of peduncle and flagellum very slender, almost naked; acicle slender, spinous and hairy. Chelipeds equal, broad, and depressed, almost naked; meros scabrous above; carpus minutely spinulose, and armed with four spines on the inner edge; hand uniformly minutely granulated, with five tubercles on the inner edge of palm; fingers with sharp, cutting inner edges; tips not spiniform; immovable finger concave below; dactylus near three times as long as the inner edge of the palm. Ambulatory feet above scabrous, spinulose and setose; dactyli with a dense series of longer setæ along the superior and inferior edges. The inner side of the penult and terminal joints in the left second foot is concave. The following are the measurements of a female specimen:—general length, 3 inches; length of carapax, 0·77; breadth of front, 0·40; length of eye, 0·41; length of chelipeds, 1·05 inch.

In this species, adapted to live in such shells as those of the genera *Conus* and *Strombus*, with long narrow apertures, the body is much flattened, and the sternum greatly developed, being broadly exposed between the chelipeds, and showing the ventral piece to which the outer maxillipeds are attached. This would, perhaps, be considered by many as a character of generic importance, but it appears to us to be only a peculiar specific modification to adapt the animal to live under peculiar circumstances. A modification which may occur in any genus of *Paguridæ*, and does occur in one other genus—instance *Pagurus platythorax*. The species we have described shows fully all the generic peculiarities of *Paguristes*, as does the *platythorax* all those of *Pagurus*.

P. depressus was found in a *Strombus pugilis* dredged in two fathoms, sandy bottom, at the island of St. Thomas, by Theo. Gill, Esq.

Spiropagurus dispar, nov. sp.

Carapax smooth and glossy, naked. Eyes rather longer than in *S. spiriger*, but not over-reaching the tip of the acicle. Ophthalmic scales narrow. Chelipeds slender, smooth, glabrous, sparsely ciliated, unequal in size, the left one being much more slender, though but little shorter than the right; left hand with slender fingers as long as the palm. Right hand a little longer than the left, and twice as broad and thick; fingers short, not more than half the length of the palm, and coarsely toothed within. Ambulatory feet much longer than the chelipeds and over-reaching their extremities, smooth and hairy; dactyli very slender, not dilated. Feet of the fourth pair almost simple; penult joint with no scabrous surface, but a few corneous marginal denticles. Length about one inch. Colors mostly faded in our specimens; the hands are, however, pale orange, loosely reticulated with thread-like crimson lines, on the white fingers as well as on the palm.

This small species was found in the white shell of a *Natica*, around the aperture of which was an incrustation formed by some hydroid polype. It was dredged from a sandy bottom in two fathoms, at the island of Barbadoes, by Theo. Gill, Esq.

It is interesting as being the second species of a genus which has heretofore contained but one known representative, *S. spiriger* of Japan.

Eupagurus bernhardus.

Pagurus bernhardus (Linn.), Fabr.; Gould; Inv. Mass.
Eupagurus bernhardus, Brandt.

Found on the north-east coast as far south as Long Island. Specimens have been sent from Puget Sound, by Dr. Kennerly.

Eupagurus kroyeri, nov. sp.

Carapax and feet naked, or only slightly pubescent. Chelipeds inconspicuously spinulose, spinules numerous, but very small and short. Right carpus elongated, and expanding at the base of the hand. Right hand twice as long as broad; fingers slender, depressed, with corneous tips. Left hand with its carina single, very sharply prominent, denticulated, and running to the right of the median line; surface beneath the carina to the right, smooth; extero-inferior edge of the hand sharp and slightly dilated. Ambulatory feet reaching beyond tips of chelipeds. Posterior margin of the last caudal segment deeply emarginated and spinulose. Length two inches.

Found at Grand Manan, and in Massachusetts Bay, by myself, and also occurs in Puget Sound.

There are two species on our north-east coast, which have been confounded under the name of *Pagurus pubescens*. In the *first*, a large species, the feet are thickly pilose, the tarsi much curved, the right cheliped spinulose, and over-reaching the ambulatory feet of the same side, and the left hand armed only with a low, obtuse, and often double carina. In the *second*, smaller, the feet are scarcely at all pubescent, the spines shorter, the tarsi straighter, and the carina of the left hand thin and sharply prominent. Kroyer's figures and descriptions seem to comprehend both these species, and we would propose to restrict his specific name to the *first*, to which the name *pubescens* most properly belongs. The *second* we have described above, under the name *Kroyeri.* Both are arctic species, occurring on both sides of the continent.

Eupagurus samuelis.

Plate I. fig. 8.

Eupagurus samuelis, Stimpson; Crust. and Echin. Pacific Coast of N. Am., p. 42.

This species was originally described from a single dried specimen in a bad condition. A large number of specimens have since been sent from Monterey, by Mr. Taylor; and comparisons of numerous individuals, of both species, show that it is closely allied to *E. hirsutiusculus.* It may, however, always be distinguished by its broader right hand, with a sharply compressed and arcuated outer margin, and by having a sharply prominent tubercle on the inferior surface of the meros-joint in both chelipeds.

Eupagurus granosimanus, nov. sp.

Rostrum or median lobe of front broad, obtuse, not prominent. No sharp teeth between the bases of the eyes and antennæ. Eyes rather long, but shorter than the peduncle of the outer antennæ. Acicle of these antennæ small and slender, not reaching to the tips of the eyes, flattened above, with the inner edge setose; flagellum very long, compressed, naked. Feet naked in the adult. Right cheliped very long, in the adult over-reaching the tips of the ambulatory feet; meros below granulated and bi-tuberculated, and above pectinated at the anterior margin with seven or eight short, irregular teeth; carpus and hand evenly oblong, granulated above and below, granules depressed, largest and most crowded on the fingers; carpus nearly twice as long as broad; hand a sixth part longer than the carpus; dactylus four-fifths as long as the palm; outer edge of immovable finger rather sharp; tips of fingers calcareous. Left cheliped short, in full-grown specimens not reaching to the posterior margin of the right hand; surface granulated as in the right cheliped; meros smooth below; superior edge of carpus sharp and armed with four or five short spines; hand convex, prominently granulated, and showing at the middle of the base above, indications of a groove and carina, which are not, however, continued further. Ambulatory feet short, spinulose along the superior edges; dactyli longer than penult joint, not twisted, their edges not sharp, tips long, corneous. Color reddish; feet regularly maculated with light-blue or yellowish spots, very small, oblong, sub-equal; tubercles of under side of meros white. General length, 2·4; length of carapax, 0·47; width of front, measured between outer bases of antennæ, 0·22 inch.

This species resembles *E. middendorffii* in its proportions, but is readily distinguished by the more strongly granulated surface of its chelipeds, and the spinules on the superior edges of the other feet.

Found at Monterey, Cal., by Mr. Taylor, and in Puget Sound by Dr. Kennerly.

Eupagurus brevidactylus, nov. sp.

Carapax smooth, nearly naked. Rostral point very obtuse. Eyes very long and slender, somewhat tapering, slightly curved, and reaching to the extremity of the peduncle of the outer antennæ; cornea scarcely at all dilated. Ophthalmic scales short and broad. Feet sparsely hairy. Chelipeds spinulose above, beneath smooth and naked. In the right cheliped the palm of the hand is large, longer than the carpus, and one-half longer than the fingers;—the fingers are each armed with a tooth within at the middle. Left cheliped reaching to the middle of the dactylus of the right one; fingers gaping. Ambulatory feet smooth; a small spine at extremity of the carpal joint; dactyli very short, shorter than the penult joint and not twisted. Color pale reddish; feet with interrupted longitudinal stripes of darker red. Length about one inch.

Found at Barbadoes, by Mr. Gill.

Eupagurus pollicaris.

Pagurus pollicaris, Say; Jour. A. N. S., Philad., i., 162.
" " Gould; Inv. Mass., 329.
" " Gibbes; loc. cit., 189.

Common on the eastern coast of the United States. Found at St. Augustine, Fla., by Dorman; and at Brazos Santiago, Texas, by Wurdemann.

Eupagurus operculatus, nov. sp.

Plate I., figs. 9 and 10.

This species may be easily recognised by the great expansion of its right cheliped, the hand of which is one half broader than the carapax, and serves as an operculum, closing the aperture when the animal retires within the shell which it inhabits. This hand is broader than long, very thin, with the margins expanded and lamelliform; surface even, granulated minutely above but more prominently below; superior surface of dactylus with a median ridge; carpus subtriangular, margined on either side by a ridge, that on the left side denticulated. Left cheliped subcylindrical, very slender and weak; carpus with a row of minute spines above. Ambulatory feet slender, glabrous, nearly naked, with a spine at the apex of the carpal joint; dactylus shorter than the penult joint, and armed below with corneous spinules. Dactylus of fourth pair of feet broadly expanded. The carapax is smooth and glossy, naked; eyes exceeding the much curved acicle in length, and scarcely shorter than the peduncle of the outer antennæ; apex of ophthalmic scales long and slender. In the great cheliped the carpus is crimson, maculated with bluish-white; hand white. Length of the animal about one inch.

It is somewhat allied to *E. tenuimanus*, Dana.

Found at the Tortugas, Florida, by Dr. Whitehurst.

LIST OF FIGURES ON PLATE I.

Fig. 1. *Speocarcinus carolinensis*, ♂ nat. size.

" 2. Posterior portion of sternum in the same, showing base of abdomen, nat. size.

" 3. Dactylus of ambulatory foot of the same, magnified.

" 4. *Petrolisthes tridentatus*, ♂ magnified two diameters.

" 5. *Pachycheles rudis*, ♀ nat size.

" 6. Terminal joint of the abdomen in *Albunaea Gibbesii*, ♂ twice nat. size.

" 7. *Hapalogaster cavicauda*, ♂ nat size.

" 8. Right hand of *Eupagurus samuelis*, twice nat. size.

" 9. Right hand of *Eupagurus operculatus*, nat. size.

" 10. The same, side view.

XII.—*List of the Known Species of* Pisidium, *with their Synonymy.*

By Temple Prime.

Read 28th February, 1859.

1. abditum Hald. Ac. N. S. Phil. Proc. 1, 53, 1841.—De Kay, 225, 1841.—Jay Cat. 4 edit. 466, 1852.—Pr. Bost. Jl. VI. 359, pl. XI. f. 24–25, pl. XII. f. 1, 1852.—Bgt. Amen.. 1, p. 53, 1853.—Hartman Cat. 1853.—Lewis Bost. Proc. VI. 2, 1856.

Cyclas minor C. B. Ads. Bost. Proc. 1, 48, 1841.—Bost. Jl. IV. 39, pl. IV. f. 2, 1841.—C. B. Ads. Vermt. 19, 1842.—Migh. Bost. Jl. IV. 319, 1843.—Linsl. Amer. Jl. 48, 276, 1845.—C. B. Ads. Cat. 30, 1847.—Jay Cat. 4 edit. 32, 1850.—Pr. Bost. Proc. IV. 165, 1851.—Bgt. Amen. 1, p. 8, 53, 1853.

Pisidium minus Stimp. Moll. N. E. 16, 1851.—Pr. Bost. Jl. VI. 360, pl. XII. f. 2–4, 1852.

" *obscurum* Pr. Bost. Proc. IV. 161, 1851.—Bost. Jl. VI. 359, 1852.

" *Kurtzi* Pr. Bost. Proc. IV. 162, 1851.—Bost. Jl. 361, pl. XII. f. 5–7, 1852.

" *zonatum* Pr. Bost. Proc. IV. 162, 1851.—Bost. Jl. VI. 364, pl. XII. f. 17–19, 1852.—Lewis Bost. Proc. VI. 2, 1856.

" *regulare* Pr. Bost. Jl. VI. 363, pl. XII. f. 11–13, 1852.

" *notatum* Pr. loc. sup. cit. VI. 365, pl. XII. f. 20–22, 1852.

" *amplum* Ingalls MSS. 1855.

" *resartum* " loc. sup. cit. 1855.

" *rubrum* Lewis MSS. 1855,

" *plenum* " loc. sup. cit. 1855.

Hab. N. Amer.

— *abruptum Hald.* Ac. N. S. Phil. Proc. 1, 53, 1841, is P. Virginicum Bgt.

— *acutum Pf.* Wiegm. Archiv. 1, 230, 1831, is P. Henslowianum, Jen.

2. Adamsi Pr. Stimp. Moll. N. E. 16, 1851.—Pr. Bost. Jl. VI. 352, pl. XI. f. 1–3, 1852.

Cyclas nitida Migh. (non Hanl.) Bost. Proc. 1, 48, 1841.—Bost. Jl. IV. 39, pl. IV. f. 3, 1841.—loc. sup. cit. IV. 319, 1843.—Linsl. Amer. Jl. 48, 276, 1845.—Pr. Bost. Proc. IV. 165, 1851.—Bgt. Amen. 1, p. 8, 1853.

— *æquale Rafin.* Pr. Bost. Jl. VI. 367, 1852, is P. Virginicum Bgt.

— *altile Anth.* Pr. Bost. Jl. VI. 353, pl. XI. f. 10–12, 1852, is P. compressum Pr.

3. amnicum Jen. Trans. Camb. Phil. Soc. IV. pt. 2, 309, pl. XIX. f. 2, 1832.

Tellina amnica Müller 2, 205, 1774.

" *striata* Schrot. 193, 1779.

" *rivalis* Mat. & Rack. Trans. Linn. Soc. 3, 44, pl. XIII. f. 37–38, 1797.

Cyclas palustris Drap. tabl. 106, 1801.

Cardium amnicum Mat. 86, 1803.

Cyclas obliqua Lam. V. 559, 1818.

Pisidium obliquum Pf. Syst. Anord. 124, pl. V. f. 19–20, 1821.

Cyclas amnica Turt. Conch. 250, pl. II. f. 15, 1822.

Pera fluviatilis Leach in Jen. Trans. Camb. Phil. Soc. IV. pt. 2, 310, 1832.

" *Henslowiana* Leach in Jen. loc. sup. cit. 310, 1832.

Pisid. inflatum Meg. Porro 121, pl. II. f. 13, 1838.

Cyclas Pfeifferi Meg. loc. sup. cit. 121, 1838.

Pisid. palustre Nils. loc. sup. cit. 122, 1838.

" *Pfeifferi* Ziegl. Villa Lomb. 10, 1844.

Cordula amnica Leach Brit. Moll. 292, 1852.

Pisid. Grateloupianum Norm. Cycl. 4, 1854.

" *intermedium* Gas. Pisid. 11, pl. I. f. 4, 1855.

" *sulcatum* Parr. MSS.

Hab. Europe.

— *amplum Ingalls* MSS. 1855, is P. abditum Hald.

4. antiquum Braun.

Hab. Germ. (fossil).

5. arcuatum Pr. Bost. Jl. VI. 364, pl. XII. f. 14–16, 1852.
Hab. N. Amer. (fossil).

— *australe Phil.* Moll. Sicil. 1, 39, 1816, is P. casertanum Bgt.

— *Baudonianum Ces.* Pisid. Or. 4, 1855, is P. Gassiesianum Dup.

— *Bonafouxianum Ces.* loc. sup. cit. 6, 1855, is P. Henslowianum Jen.

— *Brongniartinum Bgt.* Sph. 51, 1854, is P. cuneatum Petit.

— *caliculatum Dup.* extram. Gall. test. No. 229, 1849, is P. casertanum Bgt.

6. Canariense Shutl. Diag. n. Moll. 12, 1852.
Hab. Canary Islds.

7. cardiolum Desh. Inv. Par. 525, pl. XXXIV. f. 26–29, 1857.
Hab. France (fossil).

8. casertanum Bgt. Cat. Saulcy. 80, 1853.

Cardium casertanum Poli I. 65, pl. XVI. f. 1, 1791.
" *amnicum* (Jr.) Mont. 8?, 1803.
Cyclas vitrea Risso IV. 338, 1826.
Pera pulchella Leach MSS. Brit. Mus. 1830.
Pisid. pulchellum Jen. Trans. Camb. Phil. Soc. IV. 2 pt. 306, pl. XXI. f. 1–5, 1832.
" *australe* Phil. Moll. Sicil. 1, 39, 1836.
" *cinereum* Ald. Supplem. Cat. 4, 1837.
" *Lumsternianum* Forb. Ann. n. h. 225, pl. XII. f. 4, 1839.
Cyclas pulchella Hanl. Rec. Spec. 1, 91, 1843.
" *cinerea* Hanl. loc. sup. cit. 1, 91, 1843.
" *lenticularis* Norm. Cycl. 8, f. 7–8, 1844.
Pisid. Joannis McGil. Scot. 248, 1844.
" *Jenynsi* McGil. loc. sup. cit. 249, 1844.
" *vitreum* Pf. Verany Cat. 13, 1846.
" *nitidum* Jen. Gas. Agen. 209, 1849.
" *limosum* Gas. loc. sup. cit. 206, pl. 2, f. 10–11, 1849.
" *iratianum* Dup. Gall. extram. test. 234, 1849.
" *thermale* Dup. loc. sup. cit. 238, 1849.
" *caliculatum* Dup. loc. sup. cit. 229, 1849.
" *sinuatum* Bgt. Jl. Conch. 421, 1851.—49, pl. I. f. 6–10, 1852.
" *lenticulare* Dup. Moll. Fr. 680, pl. 30, f. 2, 1852.
" *rotundum* Ces. Pisid. Cr. 6, 1855.

Pisid. globulosum Gas. Pisid. 21, pl. 2. f. 8, 1855.
" *planum* Pf.
" *Stabileii* Schmidt. MSS. 1858.

Hab. Europe.

— *cicer Pr.* Ann. N. Y. Lyc. VI. 65, pl. I. f. 1, a–c, 1853, is P. compressum Pr.

— *cinereum* Ald. Suppl. Cat. 4, 1837, is P. casertanum Bgt.

9. compressum Pr. Bost. Proc. IV. 164, 1851.—Ann. N. Y. Lyc. V. 219, pl. VI. 1852.—Bost. Jl. VI. 356, pl. XI. f. 13–15, 1852. Jay Cat. 4 edit. 466, 1852.—Bgt. Amen. 1, 52, 1853. —Hartm. Cat. 1853.—Lewis Bost. Proc. VI. 2, 1856.

Cyclas altilis Anth. C. B. Ads. Cat. 29, 1847.
Pisid. altile Anth. in Pr. Bost. Jl. VI. 353, pl. XI. f. 10–12, 1852. —Jay Cat. 4 edit. 466, 1852.—Bgt. Amen. 1, p. 52, 1853.— Lewis Bost. Proc. VI. 2. 1856.
" *cicer* Pr. Ann. N. Y. Lyc. VI. 65, pl. I. f. 1, a–c, 1853.

Hab. N. Amer.

10. conicum Baud. Pisid. 50, pl. V. f. B. 1857.

Hab. France.

11. contortum Pr. Ann. N. Y. Lyc. VI. 65, pl. I. f. 2, a–c, 1853.

Hab. N. Amer. (fossil).

— *cornea. Veruny.* Cat. 13, 1846, Sphærium, Scopoli 1771.—Cyclas, Brug. Lam. 1806, is Sphærium corneum Scop.

12. cuneatum Petit Jl. Conch. 422, 1851.

Cyclas cuneata Sowb. Edin. n. Phil. Jl. VII. 297, 1829.
" *Brongniartina* Math. Cat. meth. 145, pl. XIV. f. 2, 1842.
" *Matheroni* d'Orb. Prod. 2, 304, 1850.
Pisid. Brongniartinum Bgt. Sph. 51, 1854.

Hab. France (fossil).

— *Ddingoli Villa* Cat. 44, 1841, is Sphærium Ddingoli Bivona.

— *diaphanum* Hald. Ac. n. s. Phil. Proc. 1, 53, 1841, is Sphærium maculatum Morelet.

13. Denainvilliersi Desh. Jur. Par. 526, pl. XXXIV. f. 30–33, 1857.

Cyclas Denaiuvilleirsi Boissy Bull. Soc. Geol. 2 ser. IV. 178, 1846. —Mem. (do.) 2d ser. III. 269, pl. V. f. 4, a–b, 1848.

Hab. France (fossil).

— *dubium Hald.* Ac. n. s. Phil. Proc. 1, 103, 1841, is Pisid. Virginicum Bgt.

14. duplicatum Pf.

Cyclas duplicata. Pf. Syst. Anord. 230, 1821.

Hab. Germ.

— *Dupuyanum Norm.* Cycl. 5, 1854, is Pisid. Henslowianum Jen.

15. equilaterale Pr. Bost. Jl. VI. 366, pl. XII. f. 23-25, 1852.

Hab. N. Amer.

16. exaratum Dkr. Weald. 56, pl. XIII. f. 14–15, 1846.

Hab. Germ. (fossil).

17. Ferroense Morch Suenson Cat. 43, 1857.

Hab. Ferroe Islds.

18. ferrugineum Pr. Bost. Proc. IV. 162, 1851.—Bost. Jl. VI. 362, pl. XII. f. 8–10, 1852.

Hab. N. Amer.

— *fontinale Pf.* Syst. Anord. 125, pl. V. f. 15–16, 1821, is P. pusillum Jen.

19. fuscum Parr. Jellebor. Moll. Austr. 22, 1851.

Hab. Germ.

20. Gassiesianum Dup. Agen. 207, pl. II. f. 11, 1849.

Pisidium Normandianum Dup. loc. sup. cit. 206, 1849.

" *tetragonum* Norm. Cycl. 5, 1854.

" *Baudonianum* Ces. Pisid. Cr. 4, 1855.

Hab. France.

— *globulosum Gas.* Pisid. 21, pl. II. f. 8, 1855, is P. casertanum Bgt.

— *grande Whit.* MSS. 1855, is P. variabile Pr.

— *Grateloupianum* Norm. Cycl. 4, 1854, is P. amnicum Jen.

21. Henslowianum Jen. Trans. Camb. Phil. Soc. IV. pt. 2 308, pl. XXI. f. 6–7, 1832.

Pera Henslowiana Leach MSS. Brit. Mus. 1819.

Cyclas acuta Pf. Syst. Anord. 230, 1821.

Tellina Henslowana Shep. Trans. Linn. Soc. XIV. 150, 1823.

Cyclas appendiculata Turt. Man. 15, pl. I. f. 6, 1831.

Pisidium acutum Pf. Wiegm. Archiv. 1, 230, 1831.
Pera appendiculata Leach Brit. Moll. 292, 1852.
Pisidium Jayanum Gas. MSS. 1852.
" *Dupuyanum* Norm. Cycl. 5, 1854.
" *pallidum* Gas. Pisid. 16, pl. I. f. 10, 1855.
" *Bonnafouxianum* Ces. Pisid. Cr. 6, 1855.
" *Jandouinianum* Gas. Pisid. 18, pl. II. f. 2, 1855.
" *pictum* Ces. Moll. Creuse. 9, 1857.

Hab. Europe.

— *incertum Norm.* Cycl. 6, 1854, is P. nitidum Jen.

— *inflatum Meg.* Porro 121, pl. II. f. 13, 1838, is P. amnicum Jen.

— *intermedium* Gas. Pisid 11, pl. I. f. 4, 1855, is P. amnicum Jen.

— *iratianum Dup.* Extram. Gall. test. No. 234, 1849, is P. casertanum Bgt.

— *Jaudouinianum Gas.* Pisid. 18, pl. II. f. 2, 1855, is P. Henslowianum Jen.

— *Jayanum Gas.* MSS. is P. Henslowianum Jen.

— *Jengusi McGil.* Scot. 249, 1844, is P. casertanum Bgt.

— *Joannis McGil.* loc. sup. cit. 248, 1844, is P. casertanum Bgt.

— *Kurtzi Pr.* Bost. Proc. IV. 162, 1851, is P. abditum Hald.

22. laevigatum Bgt. Jl. Conch. 175, 1852.—Desh. Jurt. Par. 525, 1857.

Cyclas laevigata Desh. (non Schum.) Dict. class h. n. V. 220, 1824.
" *sublaevigata* d'Orb. Prod. 2, 304, 1850.

Hab. France (fossil).

— *lenticulare Dup.* Moll. Fr. 681, pl. XXX. f. 2, 1850, is P. casertanum Bgt.

— *limosum Gas.* Agen. 206, pl. II. f. 10–11, 1849, is P. casertanum Bgt.

— *Lumsternianum Forb.* An. N. H. 2, 255, pl. XII. f. 4, 1839, is P. casertanum Bgt.

23. Mallet Dum. & Mort. Cat. 1853.

Hab. Switzerland (fossil).

— *minimum* Stud. Mem. Soc. Helv. etc. 1, p. 25, 1837, is P. obtusale Pf.

— *minus Stimp.* N. E. Moll. 16, 1851, is P. abditum Hald.

— *Moquinianum Bgt.* Amen. 1, p. 61, pl. III. f. 13–17, 1855, is Sphaerium maculatum Morelet.

24. nitidum Jen. Trans. Camb. Phil. Soc. IV. pt. 2, 304, pl. XX. f. 7–8, 1832.

Cyclas pusilla Turt. Man. 16, pl. I. f. 7, 1831.

" *nitida* Hanl. (non Migh.) Spec. etc. 1, p. 90, pl. XIV. f. 46, 1843.

Pisid. incertum Norm. Cycl. 6, 1854.

Hab. Europe.

— *Normandianum Dup.* Gas. Agen. 206, 1849, is P. Gassiesianum Dup.

— *notatum Pr.* Bost. Jl. VI. 365, pl. XII. f. 20–22, 1852, is P. abditum Hald.

25. Novi Eboraci Pr. Ann. N. Y. Lyc. VI. 66, pl. I. f. 3, a. c. 1853.

Hab. N. Amer.

26. nucleum Bgt. Sph. 51, 1854.—Desh. Inv. Par. 526, pl. XXXIV. f. 23–25, 1857.

Cyclas nuclea Boissy Bull. Soc. Geol. 2d. ser. IV. 178, 1846.—Mem. (do.) 2d ser. III. 270, pl. V. f. 1, 1848.

Hab. France (fossil).

— *obliquum Pf.* Syst. Anord. 124, pl. V. f. 19–20, 1821, is P. amnicum Jen.

— *obscurum Pr.* Bost. Proc. IV. 161, 1851, is P. abditum Hald.

27. obtusale Pf. Syst. Anord. 125, pl. V. f. 20–21, 1821.

Cyclas obtusalis Lam. V. 559, 1818.

" *minima* Stud. Verz. 93, 1820.

" *gibba* Ald. Trans. Soc. Northd. 1, pt. 1, p. 41, 1830.

Pera gibba Leach MSS. 1832.

Pisid. minimum Stud. Mem. Soc. Helv. etc. 1, 25, 1837.

Cyclas ovalis Nils. Jen. Trans. Camb. Phil. Soc. IV. pt. 2d, 1832.

Pisid. ovale Petit Jl. Conch. 421, 1851.

Hab. Europe.

— *ovale Petit.* Jl. Conch. 421, 1851, is P. obtusale Pf.

— *pallidum Gas.* Pisid. 16, pl. I. f. 10, 1855, is P. Henslowianum Jen.

— *palustre Porro* 122, 1838, is P. amnicum Jen.

— *parasiticum* Parr. MSS. is Sphærium ferrugineum Krauss.

28. Pfeifferi Roch & Dukr. K. D. Oolit. 60, pl. VII. f. 5, 1857.

Hab. Germ. (fossil).

— *Pfeifferi Ziegl.* Villa Lomb. 10, 1844, is P. amnicum Jen.

— *pictum Ces.* Moll. Cr. 9, 1857, is P. Henslowianum Jen.

— *planum Pf.* MSS. is P. casertanum Bgt.

— *plenum Lew.* MSS. 1855, is P. abditum Hald.

29. praetermissum Noulet Coq. Fos. 56, 1854.

Hab. France (fossil).

30. priscum Eichw. Leth. Ross. 1, 87, pl. V. f. 8, 1852.

Cyclas prisca Eich. Nat. Hist. Skizze 207.

Hab. Russia (fossil).

— *pulchellum Jen.* Trans. Camb. Phil. Soc. 2d pt. IV. 306, pl. XXI. f. 1–5, 1832, is P. casertanum Bgt.

31. pusillum Jen. Trans. Camb. Phil. Soc. 2d pt. IV. 302, pl. XX. f. 4–6, 1832.

Tellina pusilla Gml. 3231, 1789.

Cyclas fontinalis (*pars.*) Dup. Hist. Moll. 130, pl. X. f. 11–12, 1849.

Pisidium fontinale Pf. Syst. Anord. 125, pl. V. f. 15–16, 1821.

Cyclas pusilla Turt. Man. 16, pl. I. f. 7, 1831.

Englesa Henslowiana Leach MSS. Brit. Mus. 1832,

Pisid. roseum Scholtz. Moll. Schl. 140, 1843.

Hab. Europe.

32. pygmeum Roch & Dukr. Oolit. 60, pl. VII. f. 5, b. c. 1837.

Hab. Germ. (fossil).

33. Recluzianum Bgt. Jl. Conch. 174, pl. VIII. f. 8, 1852.

Hab. Europe.

— *regulare Pr.* Bost. Jl. VI. 363, pl. XII. f. 11–13, 1852, is P. abditum Hald.

— *resartum Ingalls* MSS. 1855, is P. abditum Hald.

— *roseum Scholtz.* Moll. Schl. 140, 1843, is P. pusillum Jen.

34. rotundatum Pr. Bost. Proc. IV. 164, 1851.—Bost. Jl. VI. 357, pl. XI. f. 19–21, 1852.

Hab. N. Amer.

— *rotundum Ces.* Pisid. Cr. 6, 1855, is P. casertanum Bgt.

— *rubellum Pr.* Bost. Proc. IV. 163, 1851, is P. tenellum Gould.

— *rubrum Lewis* MSS. 1855, is P. abditum Hald.

— *Ryllieme Bgt.* Sph. 52, 1854, is Sphærium Rylliense Boissy.

35. semen Menke Moll. N. Holld. 40, 1843.

Hab. Oceanica.

— *sinuatum Bgt.* Jl. Conch. 421, 1851, is P. casertanum Bgt.

— *splendidum Parr.* MSS. is a Nucula.

— *Stabileii Schmidt* MSS. is P. casertanum Bgt.

36. Steenbuchi Mörch Gronld. 19, 1857.

Cyclas Steenbuchi Moll. Ind. Moll. Grl. 20, 1842.

Hab. Greenland.

37. supinum Schmidt Zeit. Malak. 119, 1850.

Hab. Germ.

— *sulcatum* Parr. MSS. is P. amnicum Jen.

38. tenellum Gould Ag. L. Sup. 245, 1848.—Bost. Jl. VI. 361, pl. XII. f. 5–7, 1852.

Pisid. rubellum Pr. Bost. Proc. IV. 163, 1851.

Hab. N. Amer.

— *tetragonum Norm.* Cycl. 5, 1854, is P. Gassiesianum Dup.

— *thermale Dup.* extram. Gall. test. No. 238, 1849, is P. casertanum Bgt.

39. variabile Pr. Bost. Proc. IV. 163, 1851.—Jay Cat. 4 edit. 466, 1852.—Bost. Jl. VI. 351, pl. XI. f. 7–9, 1852.—Bgt. Amen. 1, p. 53, 1853.—Hartm. Cat. 1853.—Lewis Bost. Proc. VI. 2, 1856.

Pisid grande Whitt. MSS. 1855.

Hab. N. Amer.

— *Veatleyii Petit* Jl. Conch. 421, 1851, is Sphærium maculatum. Morelet.

40. ventricosum Pr. Bost. Proc. IV. 68, 1851.—loc. sup. cit. IV. 165, 1851.—Stimp. N. E. Moll. 16, 1851.—Jay Cat. 4 edit. 466, 1852.—Girard Biblio. Amer. 53, 1852.—Bgt. Amen 1, p. 53, 1853.—Lewis Bost. Proc. VI. 2, 1856.

Hab. N. Amer.

41. Virginicum Bgt. Amen. 1, p. 53, 1853.

Tellina Virginica Gml. 3236, pl. CLIX. f. 15, 1788.

Tellina pusilla (*pars.*) Dillw. 2, 106, 1819.

Cyclas Virginica Fer. Mag. Zool. 1835.—Bgt. Amen 1, p. 10, 1853.

" *dubia* Say. Nichol. Ency. 1816, 1818, 3d edit. p. 4, pl. I. f. 10, 1819.—Rafin. An. gen. scie. phy. 319, 1820.—Fer. Mag. Zool. 1835.—Gould Rept. 75, f. 56, 1841.—De Kay 223, pl. XXV. f. 261, 1842.—Linsl. Amer. Jl. 48, p. 276, 1845.—C. B. Ads. Cat. 29, 1847.—Jay Cat. 4 edit. 32, 1850.—Bgt. Amen. 1, p. 53, 1853.

" *dubiosa* Say. Jay Cat. 3 edit. 16, 1839.—Catlow & Reeve. 29, 1845.—Bgt. Amen. 1, p. 53, 1853.

" (*Physemoda*) *æqualis* Rafin. Ann. gen. scie. Phy. V. 319, 1820.

Pisidium abruptum Hald. Ac. n. s. Phil. Proc. 1, 53, 1841.—De Kay 225, 1842.—Bgt. Amen. 1, p. 53, 1853.

" *dubium* Hald. Ac. n. s. Phil. Proc. 1, 103, 1841.

" " Say Gould Ag. L. Sup. 245, 1848.

" " Gould Pr. Bost. Proc. IV. 165, 1851.—Stimp. N. E. Moll. 16, 1851.—Pr. Bost. Jl. VI. 354, pl. XI. f. 4–6, 1852.—Hartm. Cat. 1853.—Lewis Bost. Proc. VI. 2, 1856.

" *æquale* Rafin. Pr. Bost. Jl. VI. 367, 1852.

Hab. N. Amer.

— *vitreum Pf.* Verany Cat. 13, 1846, is P. casertanum Bgt.

— *zonatum Pr.* Bost. Proc. IV. 162, 1851, is P. abditum Hald.

Tellina pusilla (*pars.*) Dillw. 2, 106, 1819.

Cyclas Virginica Fer. Mag. Zool. 1835.—Bgt. Amen, 1, p. 10, 1853.

" *dubia* Say. Nichol. Ency. 1816, 1818, 3d edit. p. 4, pl. I. f. 10, 1829.—Rafin. An. gen. scie. phy. 319, 1820.—Fer. Mag. Zool. 1835.—Gould Rept. 75, f. 56, 1841.—De Kay 223, pl. XXV. f. 261, 1842.—Linsl. Amer. Jl. 48, p. 276, 1845.—C. B. Ads. Cat. 29, 1847.—Jay Cat. 4 edit. 32, 1850.—Bgt. Amen. 1. p. 53, 1853.

" *dubiosa* Say. Jay Cat. 3 edit. 16, 1839.—Catlow & Reeve, 29, 1845.—Bgt. Amen. 1, p. 53, 1853.

" (*Physemoda*) *æqualis* Rafin. Ann. gen. scie. Phy. V. 319, 1820.

Pisidium abruptum Hald. Ac. n. s. Phil. Proc. 1, 53, 1841.—De Kay 225, 1842.—Bgt. Amen. 1, p. 53, 1853.

" *dubium* Hald. Ac. n. s. Phil. Proc. 1, 103, 1841.

" " Say Gould Ag. L. Sup. 245, 1848.

" " Gould Pr. Bost. Proc. IV. 165, 1851.—Stimp. N. E. Moll. 16, 1851.—Pr. Bost. Jl. VI. 354, pl. XI. f. 4–6, 1852.—Hartm. Cat. 1853.—Lewis Bost. Proc. VI. 2, 1856.

" *æquale* Rafin. Pr. Bost. Jl. VI. 367, 1852.

Hab. N. Amer.

— *vitreum Pf.* Verany Cat. 13, 1846, is P. casertanum Bgt.

— *zonatum Pr.* Bost. Proc. IV. 162, 1851, is P. abditum Hald.

XIII.—*On the Microscopic Forms of the Harbor of Charleston, South Carolina.*

By Arthur M. Edwards.

Read February 21, 1859.

In the year 1850, Professor Bailey published, in the Smithsonian Contributions to Knowledge, a list of the microscopic organisms which he had found in mud collected from the logs of wharves, and other situations in the harbor of Charleston, S. C., comprising two new species, besides many other curious forms, and in the year 1853 he described four species of Ehrenberg's genus *Auliscus*, three of which are also found at Charleston, though Bailey failed to detect them. Bailey's list is as follows:

Actiniscus sirius, Ehr.
Actinocyclus bioctonarius, Ehr.
Actinoptychus senarius, Ehr.
Biddulphia pulchella, Gray.
Cocconeis scutellum, Ehr.
Coscinodiscus excentricus, Ehr.
Dictyocha fibula, Ehr.
Eupodiscus Rogersii, Ehr.
" radiatus, B.
Gallionella sulcata, Ehr.
Navicula sigma, Ehr.
Pinnularia interrupta, K.
" didyma, Ehr.
" lyra, Ehr.
Raphoneis rhombus, Ehr.
Stauroptera aspera, Ehr.
Surirella circumstuta, B.
Terpsinoë musica, Ehr.
Triceratium favus, Ehr.
" alternans, B.

Certain of these have been renamed by later observers, or have been found to be synonymous with already described species, and should be designated thus:

Actinocyclus bioctonarius, Ehr. = Coscinodiscus actinoptychus, Ed.
Actinoptychus senarius, Ehr. = Actinophoenia splendens, Shad.
Eupodiscus Rogersii, Ehr. = Eupodiscus argus, Ehr.
Pinnularia didyma, Ehr. = Navicula didyma, K.
" lyra, Ehr. = " lyra, K.
Raphoneis rhombus, Ehr. = Doryphora amphiceros, K.
Stauroptera aspera, Ehr. = Stauroneis pulchella, W. S.
Surirella circumstuta, B. = Tryblionella scutellum, W. S.
Gallionella sulcata, Ehr. = Orthosina marina, W. S.

Actiniscus sirius, Ehr., and *Dictyocha fibula*, Ehr , are neither of them Diatoms, but most probably portions of the skeleton of a Holothurian.

About two years since I received from a friend residing at Charleston some of the, so-called, black "pluff mud," taken from between water marks, and which I found to be extremely rich in Diatomaceous forms. The following species were observed :—

Actinocyclus undulatus, Ehr.
Actinophoenia splendens, Shad.
Auliscus caelatus, B.
“ pruinosus, B.
“ punctatus, B.
Biddulphia rhombus, W. S.
“ aurita, Brèb.
Campylodiscus cribrosus, W. S.
Cocconeis scutellum, Ehr.
Coscinodiscus actinoptychus, Ed.
“ excentricus, Ehr.
“ lineatus, Ehr.
“ oculus-iridis, Ehr.
“ radiatus, Ehr.
“ subtilis, Ehr.
Epithemia Hyndmanii, W. S.
“ musculus, K.
Navicula didyma, K.
* “ maculata, B.
* “ permagna, B.
Nitzschia scalaris, W. S.
Pleurosigma angulata, W. S.
Triceratium alternans, B.
“ favus, Ehr.
“ punctatum, T. B.
Tryblionella scutellum, W. S.
“ punctata, W. S.

The *Navicula sigma*, Ehr., of Bailey's list is most probably synonymous with the *Pleurosigma angulata*, W. S., of mine. The species marked with an asterisk (*), now placed in the genus Navicula, are characterized as follows :—

Navicula maculata = *Stauroneis maculata*, B. 1850.—“Lanceolate or elliptical, ends slightly produced and rounded ; surface punctato-striate, with a large, smooth central space.”—*Bailey*. To this description I have to add the following measurements. Length, ·0055 in. Breadth, ·00216 in. Striæ coarsely moniliform, 12 in ·001 in.

Navicula permagna = *Pinnularia permagna*, B., 1850.—“Large, lanceolate on the ventral faces, with punctato-striate marginal bands, and a broad, smooth central stripe; ends slightly rounded.”—*Bailey*. I have as yet only found this species in small quantities, and have been unable to take its measurements. There can be no doubt that these two species should be placed in the genus Navicula, as the seeming stauros in the first, the presence of which would seem to rank it in that of Stauroneis, is only a blank space, such as is seen in many species of Navicula, as *N. elegans*, etc. The presence of moniliform striæ in the second species removes it from Pinnularia, which is characterized by its markings being costæ not resolvable into dots. Of *N. maculata* I have specimens from Duval's Creek near Enterprise, Florida, for which I am indebted to Dr. Christopher Johnston of Baltimore, Md.

While examining the Charleston mud, I noticed that Smith's *Eupodiscus radiatus*, as described and figured in the first volume of his "Synopsis," is not the same as the form described under that name by Bailey in 1850. Roper remarked this same fact (Trans. Mic. Soc., Lond., Vol. VII. p. 19), but was in some doubt until I had the pleasure of forwarding to him authentic specimens from Bailey's cabinet, when he wrote to me that the examination of them confirmed his opinion, that "Smith was in error in referring the Thames Diatom to that species. It is a perfectly distinct and a true Eupodiscus."

XIV.—*Description of a* NEW SPECIES *of* EUPSYCHORTYX.

BY D. G. ELLIOT, F.Z.S.

Read March 12, 1860.

Eupsychortyx leucofrenatus.

Plate III.

Sp. Ch. Top of head, nape of neck, and upper part of throat, rufous brown. A line commencing above the eye going down side of head, and one from below the eye running to, and encircling the throat, white; each feather tipped with black. Sides of neck and lower part of throat chesnut, streaked with black and white. Forepart of back dull pinkish red, with fine zigzag lines of black; lower back with scapulars, tertials and upper tail coverts, brownish ash much blotched with black. Both edges of tertials yellowish white. Primaries and secondaries brown, with the outer edge of the latter mottled with brown and white. Tail much of the color of the upper part of back, but more mottled with grey. Entire under parts dark brownish-red, each feather having large blotches of white edged with black, small on the breast, but becoming larger on the abdomen. Bill black; feet and tarsi brownish-black. Length 7½ in.; wing 4¼; tail 2¾; tarsus 1¼.

Hab.—Honduras.

Remarks.—This new species of Eupsychortyx is allied to *E. Sonninii* of Temm., but differs in the absence of buff on the sides of the head, and in having the white blotches of the lower parts extending nearly to the throat, and not interrupted by a band of reddish. It can, however, easily be distinguished from any known species of Eupsychortyx in having two distinct white stripes on each side of the head, which give to it the appearance of wearing a bridle. The specimen described was obtained in Honduras by Mr. Amory Edwards, a gentleman much attached to Natural History, and brought by him, among some birds which he had collected during a short sojourn in that country.

Of the habits of *E. leucofrenatus* I know nothing, but suppose they do not differ from those of the other species of this genus.

XV.—*Descriptions of* THREE NEW SPECIES *of Humming-birds of the Genera* HELIOMASTER, AMAZILIA, *and* MELLISUGA.

By Geo. N. Lawrence.

Read April 9, 1860.

Heliomaster Stuartæ.

Male adult—Crown metallic bluish-green; nape and hind neck of a greenish coppery bronze; back, wing-coverts, rump and upper tail-coverts of a bronzed green; two middle tail feathers dark bronzy green, blackish at the end; the next one black, slightly bronzed with green on the outer web; the three outer ones black, with their ends tipped with white, on the two outer ones of an oval shape occupying the centre of the tip, and on the third feather only white at the apex of the feather; on the lower part of the back a concealed spot of white; wings brownish purple; chin black; throat of a luminous crimson lilac, inclining to violet; a blackish line extends underneath and beyond the eye, below which is a line of white; under plumage ashy-grey, the sides bronzed with dull green; a longitudinal stripe of pure white on the pleura; central and lower part of abdomen white; under tail coverts dusky black, bronzed with dull green at their bases, and largely tipped with white; bill and feet black.

Length about 4$\frac{1}{4}$ inches; wing 2$\frac{6}{16}$; bill 1$\frac{3}{16}$; tail 1$\frac{5}{16}$.

Habitat—St. Fé de Bogota, New Granada.

Remarks.—In general appearance it much resembles *H. longirostris*, but the black outer tail feathers and dark under tail coverts, are very distinctive characters; the throat is rather darker and differs somewhat in shade of color from that species; it is also smaller, with the bill and tail shorter, but the wings decidedly longer, and the central tail feathers proportionately shorter than in "*longirostris*," giving the tail an emarginate form.

I noticed this bird in a small collection of skins from Bogota, in the possession of my friend R. L. Stuart, Esq., who had the kindness to present it to me, and in honor of whose estimable lady I have named it, herself a proficient in some branches of science, and always an able advocate for its promotion.

I felt well satisfied on an examination of the above described specimen, of its specific distinctness from "*longirostris*," but finding a second example from the same locality, in the large collection of this family, belonging to Mr. J. G. Bell, I was strengthened in my opinion of its being so.

Mr. Bell's specimen agrees exactly in its measurements with mine, differing in color only, in having the back and rump dark grass-green less tinged with bronze.

Amazilia Xantusii.

Female.—Front adjoining the bill and lores bright rufous, crown dark-ash with a tinge of pale purple, on a side view dull green; upper plumage and upper wing coverts light shining green, in some lights, golden, paler and more golden on the upper tail-coverts, which are edged with rufous; the two central tail-feathers light shining green, golden at the end, the other tail-feathers are chestnut-red, becoming gradually paler to the outer ones, the two feathers next the middle ones on each side have longitudinal black spots on the outer side of both webs near the end, scarcely reaching to the shaft, these spots are bronzed, the next feather has the same marks but less in extent, and on the outer web being merely a marginal line, on the outer feather it consists only of a small spot on the edge of the inner web; the shafts of all the tail feathers are red; wings purplish-brown, edged on the bend of the wing with pale rufous; over the eye is a stripe of pale rufous which is continued and becomes broader over the ears, where it is white; below the eye, and extending along the side of the neck, and under the white stripe, is one of dull rufous brown; under surface of the body of a uniform rather pale rufous, on the sides of the breast and of the body under the wings, intermixed with green; under wing-coverts green, marked next the body with rufous; vent white; under tail-coverts pale rufous; upper mandible black, under mandible flesh colored for about half its length, dusky-black at the end; tarsi clothed with pale rufous feathers; feet black.

Length (measurement sent) 3·30 inches; wing 2·25; tail 1·25; bill 0·70.

Habitat.—Cape St. Lucas, South California.

Remarks.—This specimen belongs to the Museum of the Smithsonian Institution, and was sent by Mr. John Xantus, whose investigations in the Ornithology of Western North America have been the means of adding many new birds to science. In compliment to him I have named it.

I do not feel assured that it is right to place it in Amazilia, but in coloring it seems to be more like the members of this genus than those of any other, but differs from them all in having a superciliary stripe. It came labelled as a female, from which the plumage of the male may vary, but if arranged in its true position generically, it should not differ much, as Mr. Gould, in the species figured by him, makes but little difference in the sexes.

Mellisuga Merrittii.

Crown metallic bluish-green, changing to violet in some positions; back and upper wing-coverts grass-green, changing to lustrous golden-green; upper tail-coverts shining grass-green, tail dark shining green, bronzed near the end of the central tail-feathers; all the other feathers crossed with a subterminal band of dark steel-blue, ending broadly with greyish-white; wings dark purple; under-plumage cinereous-grey, with a wash of very pale buff; the sides of the neck and also of the body intermixed with golden-green; under tail-coverts grey; a line under the eye, and the ear-coverts dusky; bill apparently yellow; tarsi clothed with greyish-white feathers; feet black.

Length $2\frac{1}{4}$ inches; wing $1\frac{11}{16}$; tail 1; bill $\frac{7}{16}$.

Habitat.—Veraguas, New Grenada. Discovered by Dr. J. K. Merritt, whose name I have conferred upon it.

Remarks.—I have placed it in Mellisuga as it comes nearer to *M. minima*, found in Jamaica (the sole representative of that genus), than any other bird I am acquainted with; the tail feathers are, however, much broader and differently colored, but in the coloring of its upper and under plumage it much resembles that species.

At first I was inclined to consider it a young bird, but Dr. Merritt informed me, that he noticed several others all agreeing in the grey color below, which particularly called his attention to them. He thinks it is in mature plumage.

I am happy in being able to add a communication from Dr. Merritt, giving some of the habits of this diminutive species, which will be read with interest.

"The following observations and incidents were connected with the capture of the specimen of Humming-bird recently given to you for scientific examination.

"As you are aware, I having some years ago given my attention to the varieties of the Humming-bird species in the district of Belen, Province of Veraguas, New Grenada, and since then having been stationed in the adjoining district of El Mineral in the same province, I was induced to observe if there might not be here varieties of this family, which I had not encountered in Belen, although only fifteen miles distant.

"In the section of El Mineral there has been a slight attempt at cultivation of the soil and planting of fruit-trees, which is not the case at Belen. The Orange, Guama, and Guayava trees are the most numerous, particularly the last named, which is very prolific, bearing nearly throughout the year fruit in all its stages, from the blossom to maturity. Consequently the Guayava tree is the favorite resort of the Humming-bird.

"I often would watch those little creatures feeding and quarrelling around a tree near the door of my palm-leaf hut, and soon my attention was especially attracted to one much smaller than the rest, whose pugnacity and indomitable 'pluck' greatly amused me. Upon closer observation of this diminutive feathered warrior my interest increased, as soon as I became satisfied it was a variety new to me, and not noticed in Belen.

"I frequently afterwards saw a number of specimens of this variety of Humming-bird, and almost invariably encountered them feeding from the blossoms of the Guayava, and I therefore conclude they are quite local in their habitat."

XVI.—*Description of* TWO NEW SPECIES *of the Genus* BATISSA, *with Notes on that Genus.*

BY TEMPLE PRIME.

Read December 12, 1859.

THE genus Batissa was established a few years ago by Gray for a class of the genus Cyrena, represented by the Cyrena violacea Lamarck, which he thought differed sufficiently from Cyrena to constitute a distinct genus. Since then the genus Batissa has been adopted by Deshayes in the Proceedings of the Zoological Society of London, 1854, and by the brothers Adams in their recent work.

The species of this genus, of which I append a list, are as yet not numerous.

Batissa gigantea Prime.

T. ovato-orbiculari, oblique inæquilaterali, tumidâ, solidissimâ, magnâ, intus albâ, epidermide brunneâ vestitâ, sulcis remotis, umbonibus prominentibus, antice inclinatis; dentibus cardinalibus tribus, inæquilateralibus, brevibus, crassioribus; lateralibus angustis, serrulatis.

Long. 5½, lat. 4¾, diam. 2½ inches.

Hab.— ? Collect. Jay.

This is the largest known species of this genus. One specimen, which is in the collection of Dr. Jay, was brought to this country by the Expedition sent to Japan under Commodore Perry, without, however, any data as to the locality where it was found.

In general outline it bears some resemblance to the *B. insignis*, Deshayes.

Batissa similis Prime.

T. ovato-orbiculari, oblique inæquilaterali, tumidâ, solidâ, depressâ, intus superne albâ, postice inferneque violaceâ, epidermide nigrâ vestitâ, sulcis remotis, umbonibus profunde erosis; dentibus cardinalibus tribus, subæqualibus, caniculatis; lateralibus elongatis, angustis, subæqualibus, serrulatis.

Long. $3\frac{1}{12}$, lat. $2\frac{1}{6}$, diam. $1\frac{1}{8}$ inches.

Hab.—Nicobar. Collect. auctoris.

This species, of which I received one specimen through Mr. Bernardi of Paris, is somewhat like the *B. Kerandrenia*, but is less inflated, and posteriorly less elongated.

List of the known Species.

BATISSA GRAY.

SYNONYMY OF THE GENUS.

Cyprina and *Cyclas* Brug. 1792.— *Cyrena* Lamk. 1818.—*Batissa* Gray, 1854.

Species.

1. atrata Desh. Proc. Zool. XXII. 14, 1854.
Hab. ?

2. Australis Desh. Loc. sup. cit. XXII. 346, 1854.
Hab. Australia.

3. Childrenæ Adams Rec. Gen. 2, 448, 1858.
Cyprina Islandica Brug. Encycl. méth. pl. 301, f. 1, 1792.
Hab. Phil. Islds.

4. compressa Prime Proc. Zool. XXVIII. 1860.
Hab. Borneo.

5. corbiculoides Desh. Proc. Zool. XXII. 14, 1854.
Hab. N. Guinea.

6. elongata Pr. Proc. Zool. XXVIII. 1860.
Hab. N. Caledonia.

— *eximia Ads.* rec. gen. 2, 445, 1858.—Cyrena eximia Dunker.

7. fortis Pr. Proc. Zool. XXVIII. 1860.
Hab. N. Caledonia.

8. fuscata Pr. Proc. Zool. XXVIII. 1860.
Hab. ?

9. giganteá Pr. Ann. N. Y. Lyc. Vol. VII. 1860.
Hab. ?

10. gracilis Pr. Proc. Zool. XXVIII. 1860.
Hab. ?

11. humerosa Desh. Proc. Zool. XXII. 14, 1854.
Hab. N. Guinea.

12. inflata Pr. Proc. Zool. XXVIII. 1860.
Hab. Nicobar Islds.

13. insignis Desh. Proc. Zool. XII. 13, 1854.
Hab. Phil. Islds.

14. Jayensis Ads. Rec. Gen. 2, 448, 1858.
Cyrena Jayensis Lea. Trans. Amer. Phil. Soc. V. 108, pl. 17, f. 52, 1832.
Hab. Sumatra.

15. Kerandrenia Ads. Rec. Gen. 2, 448, 1858.
Cyrena Kerandrenia Less. Voy. Coq. 2, 429, pl. 11, f. 3, 1829.
Hab. Wiaugiou.

16. lenticularis Desh. Proc. Zool. XXII. 14, 1854.
Hab. Phil. Islds.

17. megadesma Desh. Loc. sup. cit. XXII. 14, 1854.
Hab. ?

18. minor Pr. Proc. Zool. XXVIII. 1860.
Hab. Fejee Islds.

19. obesa Ads. Rec. Gen. 2, 448, 1858.
Cyrena obesa Hinds. Ann. Mag. N. H. n. ser. X. 81, 1842.—Voy. Sulph. 2, 66, pl. XXI. f. 6, 1844.
Hab. Fejee Islds.

20. producta Desh. Proc. Zool. XXII. 13, 1854.
Hab. Phil. Islds.

21. rotundata Ads. Rec. Gen. 2, 448, 1858.
Cyrena rotundata Lea. Trans. Amer. Phil. Soc. v. 107, pl. 17, f. 51, 1832.
Hab. E. Indies.

22. similis Pr. Ann. N. Y. Lyc. Vol. VII. 1860.
Hab. Nicobar.

23. sphæricula Pr. MSS. 1859.—Collect. auctoris.
Cyrena violacea (var. *Javanica*), Mous. Moll. Java. 88, pl. XV. f. 1, 1849.
Hab. Java.

24. tenebrosa Ads. Rec. Gen. 2, 448, 1858.
Cyrena tenebrosa Hinds. Ann. Mag. N. H. n. ser. X. 81, 1842.—Voy. Sulph. 2, 66, pl. XXI. f. 7, 1844.
Hab. Fejee Islds.

25. triquetra Desh. Proc. Zool. XXII. 13, 1854.
Hab. Phil. Islds.

26. unioniformis Pr. Proc. Zool. XXVIII. 1860.
Hab. ?

27. violacea Ads. Rec. Gen. 2, 448, 1858.
Cyclas violacea Lam. Ann. Mus. VII. 421, 1806.
Cyclas violacea Lam. V. 553, 1818.—Lam. (Desh. edit.) VI. 1835.—Delast. pl. VII. f. 5, 1841.
Hab. The East.

XVII.—*Remarks on Certain Species of North American* HELICIDÆ.

BY THOMAS BLAND.

(Continued from p. 89.)

Read March 5, 1860.

Helix espiloca Ravenel.

Plate IV. fig. 1–2.

T. rimato-perforatâ, superne convexiusculâ, subtus convexâ, striatâ, rufescente-corneâ, tenui, pilis brevissimis obsitâ; spirâ vix elevatâ; anfr.

5 convexiusculis, ultimo ad aperturam breviter deflexo, disjuncto, scrobiculato-constricto; aperturâ perobliquâ, subreniformi, coarctatâ; perist. acuto, continuo, marginibus lamellâ superne excavatâ, dentem linguiformem emittente, junctis; dextro lamellâ latâ uncatâ, basali dente lamelliformi, erecto, intra aperturam producto et recurvato, instructo.

Shell perforate, above slightly convex, beneath convex, striated, reddish-horn colored, thin, with very short hairs; spire scarcely elevated; whorls 5, rather convex, the last deflected and turned outwards from the preceding one, scrobiculate, constricted, grooved within the umbilical region; aperture very oblique, subreniform, contracted; peristome acute, continuous, the margins joined by a lamella, excavated above, and produced into a tongue-shaped tooth; the right margin having a broad hooked lamella, and the base an erect lamelliform tooth produced into and recurved within the aperture.

Diam. maj. 9, min. 8, Alt. 4, mill.
" " 7 " 6 " 3 " var. *minor*.

Habitat.—Sullivan's Island, South Carolina. Dr. E. Ravenel!

Observations.—This species is certainly distinct from the others of the group. In the form of the parietal process, it is intermediate between *H. Postelliana* and *H. avara*, but most like the latter; the teeth on the peristome are very similar to those in the former, but beneath it is less inflated, the umbilical region is wider, showing more of the penultimate whorl, and it is hirsute.

I am indebted for this species to Dr. Edmund Ravenel, and adopt the name suggested by him in correspondence with Say. He informs me that many years ago he collected specimens, and thinking the shell undescribed, forwarded some to Say, with the following label, which is still in his possession, "H. avara Say? probably new, if so call it H. espiloca." Say considered them to be *avara*.*

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* See Extracts from Dr. Ravenel's letters at page 124. I am indebted to Mrs. Say for specimens of *H. Postelliana*, with label "Helix —— ? Swamps of S. Car." written by Dr. Ravenel, with the specific name "avara S" added by Say.

Seeing that Say pronounced this species and *H. Postelliana* to be *avara*, I can understand the remarks of Dr. Binney quoted by me, Annals Vol. VII. p. 31, but still am under the impression that he could not have seen the shell *described* by Say as *H. avara.*

Helix introferens, nov. sp.

Plate IV. fig. 3–4.

T. umbilicatâ, depresso-globosâ, tenuiusculâ, costulato-striatâ, corneo-luteâ; spirâ convexâ; anfr. 6, convexiusculis, ultimo antice vix deflexo, ad aperturam valde constricto, bicrobiculato, ad peripheriam subangulato, basi convexo, intra umbilicum excavato; aperturâ obliquâ, lunari, dente linguiformi valido, flexuoso, in pariete aperturali intrante coarctatâ; perist. albo, intus calloso, reflexo, margine dextro dente obtuso introrsum flexo, basali dente lamelliformi submarginali, in medio transversim tuberculato, instructo; dente inferiori intra aperturam producto, tuberculum validum formante.

Shell umbilicate, globose, depressed, thin, with riblike striæ, yellowish horn colored; spire convex, whorls six, moderately convex, the last scarcely descending, much constricted at the aperture, with two exterior pits, subangular at the periphery, convex beneath, grooved within the umbilicus; aperture oblique, lunate, with well developed arcuate parietal tooth; peristome white, thickened within, reflected; on the right margin an obtuse inflected tooth, at the base a submarginal lamelliform tooth, with transverse tubercle in the centre; the basal lamella continued within the aperture, where it forms a strong white tubercle.

Diam. maj. 15, min. 13. Alt. 7, mill. spec. from Dr. Budd's cabinet.

Diam. maj. 13, min. 11, Alt. 7, mill. spec. from Gaston Co. N. Car., Wheatley.

Var. minor. anfr 5.

Diam. maj. 11, min. 9, Alt. 6, mill. spec. from Salem, N. Car. Hartvig!

Habitat.—Gaston Co., N. Car., Wheatley. Salem, N. Car., Hartvig!

Remarks.—This shell is closely allied to the Texan species, *H. vultuosa* Gould, and also to *H. fallax* Say. It differs from the latter in the narrower umbilicus, which only shows the penultimate whorl; in the groove in the last whorl within the umbilical opening, the character of the basal tooth, and the internal tubercle (a modification of the *fulcrum* of Lea), which does not prevail in *fallax* and its immediate allies *tridentata* and *Hopetonensis.* In *H. introferens* the upper tooth is less deeply seated and less inflected, and the basal one is broader, and more elevated than in *vultuosa*, the parietal tooth is more arcuate, being indeed subangular, but is without the indication, noticeable in Gould's species, of a callus extending from its lower termination towards the upper angle of the lip. *H. vultuosa* is even smaller than the var. *minor* of my species.

Several years ago I received four or five specimens from Dr. Budd, and noticed the tubercle within the aperture, subsequently Mr. Wheatley gave me the only one in his cabinet, and the Rev. Mr. Hartvig sent me several collected by himself at Salem, N. C., where he then resided.

Helix Christyi, nov. sp.

Plate IV. fig. 5–6.

T. imperforatâ, depressâ, solidulâ, confertim costulato-striatâ, fusco-corneâ; spirâ brevi, obtusâ; anfr. 4½ convexiusculis, ultimo ad aperturam deflexo, constricto, superne gibbo, ad peripheriam subangulato; basi convexo, in medio excavato; aperturâ depressâ, dente lamelliformi valido, obliquo, in pariete aperturali intrante coarctatâ; perist. reflexo, intus albo-calloso.

Shell imperforate, depressed, rather solid, with numerous oblique rib-like striæ, dark horn-colored; spire short, obtuse; whorls 4½, rather convex, the last descending at the aperture, slightly angular at the periphery, constricted, above gibbous; base convex, excavated in the middle; aperture depressed, with a strong oblique lamelliform parietal tooth; peristome reflected, with a white callus within.

Diam. maj. 10, min. 8, Alt. 4½, mill.

Habitat.—Mountains in Cherokee Co., N. Carolina, David Christy!

Remarks.—This shell has curious affinities with other North American species. Without a hairy epidermis, and having the rib-like striæ of the small varieties of *H. tridentata* Say, it has the form of aperture, parietal tooth, and peristome of *H. inflecta* Say. Having a parietal tooth only, it is allied to *H. monodon* Rack; but independently of the form of the tooth being like that of *H. inflecta*, its closer relation to the latter is shown by the absence of the *fulcrum*, which is characteristic of the former. Being imperforate, and having the single tooth, this species is also allied to *H. germana* Gould, from Oregon, but it is less globose, and the epidermis and sculpturing are entirely different.

Helix Wheatleyi, nov. sp.

Plate IV. fig. 7.

T. imperforatâ, depresse conoideo-globosâ, tenuiusculâ, rufescente-corneâ, conferte costulato-striatâ, sub lente minute granulatâ, pilis brevissimis ornatâ; spirâ breviter conoideâ; suturâ valde impressâ; anfr. 5½, convexiusculis, ultimo rotundato, ad aperturam breviter deflexo, constricto; basi convexo, circa columellam excavato; aperturâ obliquâ, lunari, pariete aperturali tuberculo dentiformi parvo munito; perist. acuto, roseo-labiato, æqualiter angulatim reflexo, columellari adnato.

Shell imperforate, depressed, conoid-globose, thin, reddish horn-colored, with numerous rib-like striæ, and microscopic granulations with very short hairs; spire shortly conoid; suture deeply impressed; whorls 5½, rather convex, the last rounded, slightly depressed at the aperture, constricted; base convex, excavated in the umbilical region; aperture oblique, lunate, with a small parietal tooth-like tubercle; peristome acute, rose-colored, equally angularly reflected, appressed at the columella.

Diam. maj. 14, min. 12, Alt. 7, mill.

Habitat.—The mountains in Cherokee Co., N.Car., D. Christy!

Remarks.—This interesting species is in form and size most like a small variety of *H. Mitchelliana* Lea, or, the parietal tooth considered, an imperforate specimen of *H. bucculenta* Gould, but is especially distinct from both in its rufous color, granulated and hirsute surface, and excavated umbilical region.

This is the only known hirsute member, found east of the Rocky Mountains, of the sub-genus Patera Albers. *H. labiosa* Gould, which inhabits Oregon, is the only hirsute representative of that sub-genus on the western side of the mountains.

I am indebted to Mr. David Christy of Cincinnati for this and the preceding, and also specimens of other somewhat rare species found in the same region, viz. *H. barbigera* Redf.; *H. Elliotti* Redf.; *H. Clarkii* Lea, &c.

I dedicate this species to my esteemed friend Mr. C. M. Wheatley, author of the first general catalogue of the Shells of the United States, a zealous Naturalist, and generous contributor to the cabinets of others.

Helix lævigata Rafinesque.

SYNONYMY.

Helix *lævigata Fer.* Prod. 221,	1821.
—— *inornata Say.* Jl. Acad. Phil. II. 370, June,	1822.
—— " *Griffith* in sched.! fide Pfr.	

Helix *lævigata Fer.* Hist. t. 82, f. 6, 1822 ?
—— *fuliginosa Binney* Bost. Jl. III. 417 (excl. desc. syn. et fig.) 1840.
—— *lævigata Chemn.* ed. II. Helix No. 522. t. 84, fig. 17–19, 1846 !
—— " *Pfr.* Mon. Hel. I. No. 142, 1848.
—— *lucubrata Binney* Terr. Moll. II. 225, t. 32, 1851.
—— *lævigata Desh.* in Fer. Hist. I. p. 94.
—— *inornata Reeve*, No. 666, 1852.
—— *lævigata* " No. 672 ? ex parte, 1852.
—— *inornata Say*, W. G. Binney's Reprint, p. 24, 1856.
—— *lævigata W. G. Binney* Suppl. Terr. Moll. p. 108, 1859.

The following is Say's Description :—

H. inornata.—Shell subglobose, pale yellowish horn color, polished; whorls 5, rounded, wrinkled; spire convex; suture not deeply impressed; umbilicus small, profound; aperture wide, at the junction of the labia with the penultimate whorl shorter than the width of the mouth; labrum simple.

Inhabits Pennsylvania. Greatest width less than seven-tenths of an inch.

This species has a strong resemblance to *H. ligera*, but in addition to its superior magnitude, its aperture is proportionally wider, a character which of course gives the whorls a greater breadth; the whorls are also fewer in number, and the distance between the terminations of the lips is very perceptibly less than the width of the aperture, the reverse of which obtains in the *ligera.*

In my Remarks, Annals of the Lyceum, Vol. VI., p. 352, I expressed my belief that *H. inornata* Say is the same as *H. lævigata* Raf., and not the *H. inornata* of Dr. Binney. My friend Mr. W. G. Binney has since examined the subject in his Supplement to the "Terrestrial Mollusks," and concludes that his father's determination is correct.

It is not surprising that the question at this date is full of difficulty, considering that a few years only after Say's death Dr. Binney treated *fuliginosa* Griff., *lucubrata* Say, and *lævigata* Raf., as one species,—that Mr. Phillips, Curator of the

Museum of the Philadelphia Academy, labelled *lævigata* Raf. as *inornata* Say, but now states that his determinations were conjectural, while Dr. Griffith concurred at least in the repudiated label of *inornata* Say. Little confidence can be placed in the opinion given by Griffith as to the original specimen of *glaphyra* being one of *cellaria*, inasmuch as he sent examples of the latter to Dr. Ravenel under the name of *fuliginosa!*

Mr. Binney (Supp. p. 110) refers to the suggestion of an anonymous writer in Silliman's Journal (1837). In connexion with the foregoing, the following quotation of the writer's language is interesting, showing, as it does, the origin of the opinion:—"*H. glaphyra* and *inornata* Say, and *fuliginosa* Griffith, are only different ages of the same shell, if the specimens I have received from the Philadelphia conchologists be labelled correctly."

In Férussac's cabinet *inornata* Say is represented by *lævigata* Raf., and the latter by the same shell, and *fuliginosa* Griff. Deshayes remarks that he has doubts as to *lævigata*, having received it from America under the name of *inornata* Say. Pfeiffer refers to specimens of *lævigata* sent from this country as *inornata* Say, and to *inornata* By., and *fuliginosa* Griff. sent as *glaphyra* Say.

I find from original papers now in my possession, that Say, with his first letter to Férussac, sent a number of shells, and in the accompanying list of them, *H. glaphyra* is mentioned.

Férussac, in a letter dated July 15, 1820, acknowledged receipt of the shells, and of Say's publications, remarking, however, as to *H. glaphyra*, "Vous ne me l'avez pas envoyeè, mais je soubconne comme vous, Monsieur, que c'est l'analogue de notre *H. nitens*, ou *cellaria* de Müller." In the same letter Férussac asks for examples of *H. glaphyra*, and gives a list of shells forwarded to Say, among which was *H. cellaria*.

Say in his reply (of which I have before me notes, without date, in his hand-writing) observed,—"*H. glaphyra.* I am sorry that I cannot send you a specimen yet, but next season I hope to have more leisure than I had last, and shall probably be able to procure it for you, as well as some species of Limax."

In January, 1821, Say's description of *H. ligera* was published,—he observed that it "approaches nearest to *H. glaphyra*."

In October, 1822, Say wrote, with European shells, to Mr. Stephen Elliott, and in the list of them I find "*H. cellaria* L."

It must be supposed that Say knew the shell called *fuliginosa*, but in 1832 he expressed ignorance of it.

In that year Mr. Robert Peter was in correspondence with Say, and sent him a list of shells collected near Pittsburg, Pa., enumerating among them *H. glaphyra*, and *H. fuliginosa*. Say's answer may be inferred from Peter's letter to him of 30th Dec., expressing surprise that Say did not know the name *fuliginosa*, which he, Peter, supposed had been published, and which he had from Dr. Green of Philadelphia. Peter, in the letter referred to, which, through the kindness of Mrs. Say, is now in my possession, endeavored to enlighten Say by explaining that *H. fuliginosa* "resembles *H. glaphyra* Vobis, but is a distinct shell, being about twice as large, having a larger umbilicus, and being of a dark horn or fuliginous color, without any of the thickening or whitish appearance beneath, which characterizes that shell; in other respects it is very similar."

Peter, a Western naturalist, apparently instructed from Philadelphia, evidently referred *glaphyra* to *inornata* By.

All these circumstances seem to me very strongly to favor the belief not only that *glaphyra* and *cellaria* were known by Say to be distinct, but that his *glaphyra* is identical with *H. inornata* Binney, the *inornata* Say being another species.

Say could not have described *H. cellaria* in the language employed with respect to *glaphyra*, which, however, is perfectly applicable to the *Pennsylvanian* form of *inornata* By. Moreover, Say's description of *inornata* cannot be referred to Dr. Binney's shell.

In my cabinet are specimens of *H. lævigata* from N. Carolina, which in every particular—in form, size, color, and sculpture—agree with Say's diagnosis of *inornata*, and are justly comparable, especially as regards the base, with *H. ligera.*

Say mentions Pennsylvania as the habitat of his *inornata*,—it very probably occurs there, having been found in Maryland and Virginia, and also in Illinois.

Information afforded to me by Dr. Edmund Ravenel of Charleston, throws some light on all this mystery, if indeed it does not explain it.

Having through Dr. Ravenel cleared up some difficulties about *H. avara*, I inquired of him as to *H. inornata* Say, sending him a copy of my Notes on *H. glaphyra*, and specimens in illustration of my views, viz. *H. lævigata* under the name of *inornata* Say, and *H. inornata* By. under that of *H. glaphyra* Say.

On the 4th Feb., 1860, Dr. Ravenel wrote as follows:—

"The shell which you have now sent me as *H. inornata* Say is identical with my shells which I sent to Mr. Say with this name, and which he returned to me without comment. After receiving these shells from Mr. Say, having no doubt upon the matter, I distributed the shell to my correspondents, with this name, and Mr. Lea has recently written to me, that he has specimens now in his cabinet from me, with my original label, *H. inornatus.* Dr. Binney was with me, after my communication with Mr. Say, and must have seen the specimens in my cabinet, and I suppose that I sent him some.

"The shell which Mr. Binney has now sent to me as the 'true inornata,' is identical with the one you have sent as 'inornata Binney,' and which you believe to be *glaphyra.* I have not had this shell in my cabinet before.

"Griffith sent me two specimens many years ago labelled '*fuliginosa, from Pa.*' Some years after I received from England a dozen specimens of *cellaria;* on comparing these with Griffith's shells, I could see no difference. The two specimens from Griffith, and one of the British shells, I sent recently to Mr. W. G. Binney, and he returned them as *cellaria.*

"I am inclined to believe that Mr. Say's indisposition to *multiply species* induced him to unite the three shells,* with which we are now confused, under the one name *inornata*, and if it was not for the word *polished*, I would believe that my shell was the type from which his description was written. All of these shells are, I believe, found in Pennsylvania, certainly *inornata* By. and *fuliginosa*, and we can scarcely believe that they escaped the observation of so industrious a naturalist as Mr. Say. We have a similar instance of his uniting allied species in the *avara* group, in which he certainly embraced *H. Postelliana* and *espiloca*, and probably others which do not correspond with the description of the Florida *avara*."

Having heard it attributed to Say, that he never volunteered to correct errors, and even avoided indicating the shell (when directly applied to) intended by his description, I had further correspondence with Dr. Ravenel, who, under date 10th April, 1860, favored me with an explanatory letter, from which I extract the following :—

"In answer to your question whether Say ever corrected labels, I can tell you that I sent him the *H. Hopetonensis* without a name, merely writing 'Helix —— S. Car.,' and he returned some of the specimens with my label filled up 'H. tridentata var. ephabus Say.' I sent him specimens of a variety of the same, from the gardens in Charleston; he then wrote in pencil on my label, 'H. tridentata var. ephabus,—the same as the shell which you sent me several years ago.' I sent him *H. Postelliana* with my label 'Helix —— S. Car.,' and he filled up the gap with 'avara Say.' With *H. espiloca* the same thing occurred. He corrected, and also gave me names of our marine shells sent to him; and when I sent him new shells, he described them, and generally returned the specimens with his paper. I therefore infer and believe that if he had considered my label *H. inornata* incorrect, he would have corrected it; and at the same time, if he had not considered the shell to be *inornata*, he would certainly have described it as new.

"I have before expressed the opinion to you that Mr. Say sometimes grouped allied species under one name, as with *H. auriculata* and *avara*, and this is only another instance. He was certainly acquainted with *inornata* By., our *inornata* Say, and *fuliginosa*, yet we have only *from him* the one name, *inornata.*

---

* Dr. Ravenel overlooks *H. glaphyra Say*, but his explanatory suggestions are both interesting and valuable.

"I have no doubt that I derived the name *inornata* Say, which I used, from Mr. Stephen Elliott, who was in very frequent communication with Mr. Say."*

I may mention that I have letters, dated in 1822, from Mr. S. Elliott to Mr. Say, with copies, in his hand-writing, of the replies, which give very full notes on the shells sent by the former, but unfortunately not on the species now under consideration.

On the evidence thus brought together, I think myself not only justified but called upon to pronounce *H. lævigata* Raf. and *H. inornata* Say to be identical. The former name, without description, was published by Férussac in his Prodromus at about the same time as the latter by Say in the Journal of the Academy, but seeing that the shell is now better known as *H. lævigata*, and that doubts may still exist in the minds of some, it may be best to place Say's name in the synonymy of that species.

As the evidence with respect to *glaphyra* is somewhat less conclusive, I propose to let it stand in the synonymy of *H. inornata* By., retaining that name for the shell which Dr. Binney determined to be the *inornata* of Say.

Many of the species of this continent are extremely variable, and the description of any one form is not only unsatisfactory, but productive of much error. Say wrote under serious disadvantages as compared with authors of the present day, but his descriptions are remarkably accurate; and when I find a shell to which one of his specific names has been affixed not agreeing with his description, I do not pronounce it faulty, but assume that sooner or later a form such as he must have had before him will come under my notice.

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* Dr. Ravenel in another letter says, "I think that Say was cautious in his communications, but that he would give his opinion of any species, when requested to do so. He was however very much more reserved in giving specimens away, —he certainly gave them to Mr. Elliott, but I have not a single specimen given to me by Mr. Say from his Cabinet."

H. lævigata is a very variable species,—the following forms are in my cabinet:—

a. Diam. maj. 14, min. 12, Alt. 7 mill. *Hab.* unknown.
b. " " 17 " 14 " 8 " " N. Carolina.
pale yellowish horn colored, polished, irregularly striated, "wrinkled."
c. Diam. maj. 17, min. 14, Alt. 6 mill. *Hab.* Maryland.
in sculpturing much like var. *b.*
d. Diam. maj. 24, min. 20, Alt. 7 mill. *Hab.* Georgia.
regularly striated—last whorl with microscopic spiral lines on the upper surface.
e. Diam. maj. 26, min. 22, Alt. 9 mill. *Hab.* Middle Georgia.
very finely striated—microscopic elevated points in spiral lines on the upper and under surface of the last whorl—shell very thin; umbilicus larger than in other forms, and aperture more rounded; the entire shell of the same color,—in the other varieties the base is of lighter color than the upper surface. This is allied in form to *H. fuliginosa* Griff.
f. Diam. maj. 13, min. 20, Alt. 7 mill. *Hab.* Georgia.
striæ above like var. *d*, but they are continued over the periphery to the umbilical excavation.
g. Diam. maj. 23, min. 20, Alt. 9 mill. *Hab.* St. Augustine, Florida.
shell polished, sculpturing like var. *b*, the color of the upper surface as dark as *H. fuliginosa*,—beneath pale.

Helix inornata Binney.

SYNONYMY.

Helix *glaphyra Say?* Nich. Enc. IV. t. 1, f. 3,	1816.
inornata By. Bost. Jl. III. p. 419, t. 21, f. 3,	1840.
glaphyra Pfr. Mon. I. No. 120,	1848.
inornata By. Terr. Moll. II. p. 227, t. 34,	1851.

Helix *glaphyra Rv.* Conch. Icon. No. 667,	1852.
inornata W. G. By. Suppl. p. 109,	1859.
" *Pfr.* Mon. IV. No. 273,	1859.

In my remarks on *H. glaphyra* Say (Ann. Lyc. VI. 352), and in the preceding pages, I have fully stated my reasons for determining that *H. lævigata* Raf. and *H. inornata* Say are identical, and that *H. inornata* By. must be referred to *H. glaphyra* Say. To my mind the evidence is conclusive, but, as already explained, I leave the last named shell in the synonymy of *inornata* By.

I would repeat that, confining myself strictly to the *descriptions* of Say, I find that of his *inornata* applicable only to the shell known as *lævigata* Raf., and that of *glaphyra* only to the *inornata* By. Too much weight has been attached to the localities given by Say of his two shells. He attributes *inornata* to Pennsylvania, from whence we have now no authentic specimens, but the species occurs in Virginia and Maryland, and may reasonably be looked for on the borders at least of the adjoining state. *H. glaphyra* was found where certainly it was a stranger—no one knows how, or from whence it came. *H. cellaria*, to which it is referred, inhabits the New England States only, and the facts already stated indicate that Say knew *cellaria*, and in correspondence did not allude to it as his *glaphyra.*

H. inornata By. is a variable species. In many cabinets, both here and in Europe, it appears to be represented by specimens from Ohio, which, when mature, are generally by no means "very much depressed," and scarcely "pellucid, polished." I have individuals from N. Car. and also from Lycoming Co., Pa., which are planulate, pellucid, and with a very brilliant glassy polish. The Pennsylvanian form is small, and the color above is occasionally as dark as in *H. fuliginosa.* A young specimen with four whorls is much like Say's figure of *glaphyra.**

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* See Say's description of *H. glaphyra*, Ann. Lyc. Vol. VI. p. 352.

The following are measurements of specimens in my cabinet:

Diam. maj. 18, min. 15, alt. 7 mill. Ohio.
" " 15 " 13 " 5 " Maryland.
" " 14 " 12 " 5 " Lycoming Co., Pa.

I have recently received from Dr. Ravenel, for examination, a singular specimen, collected by himself on the mountains near Ashville, N. Car., which I can only refer to this species. It has 6 whorls, and measures,—

Diam. maj. 20, min. 18, Alt. 9 mill.

Helix friabilis W. G. Binney.

SYNONYMY.

Helix *friabilis W. G. Binney,* Proc. A. N. S. Phila. p. 187, 1857.
—— —— " Suppl. p. 106, 1859.
—— *lucubrata Pfr.* Mon. Hel. IV. No. 413, p. 68, 1859.

I concur with Mr. Binney in the establishment of this species, but by no means with Dr. Pfeiffer in his view that it is the *H. lucubrata Say,* with the description of which it does not agree. Say mentions that *lucubrata* is closely allied to his *inornata,* but *H. friabilis* is totally distinct both from *H. lævigata* Raf. and *H. inornata* By. W. G. Binney's shell is of uniform color, and the umbilicus is not "much larger" than that of either of the species referred to. The spire is not "much depressed."

Binney describes the shell as having four whorls, but I have seen no adult with less than five. Specimens from Illinois are very thin, but those collected by Mrs. Say in Indiana, by Moore in Texas, and received by Dr. Newcomb from De Witt Co. in the latter state, are rather less so. I am indebted to Mr. Henry Van Nostrand for a large and heavy example, having 5½ whorls, from Helena, Arkansas, the measurements of which are as follows:—

Diam. maj. 31, min. 27, Alt. 16 mill. Ap. 18 mill. longa, 15 lata.

Helix lucubrata Say.

This species was described by Say in the "New Harmony Disseminator of Useful Knowledge," II. 229 (July, 1829), and the description was republished by Mrs. Say in 1840, in "Descriptions of some New Terr. and Fluv. Shells of N. America."

The subjoined copy is from the reprint of W. G. Binney.

"*H. lucubrata.* Shell subglobose, depressed, reddish brown, polished, subtranslucent; whorls over four, much wrinkled; spire much depressed, convex; suture moderate; beneath paler; umbilicus open, rather large; aperture nearly orbicular; labrum simple.

"Greatest width one inch. Inhabits Mexico. Closely allied to *H. inornata* Nob., but the umbilicus is much larger, and the aperture is more accurately rounded; the color is nearly the same, excepting that in the present it is of a deeper shade."

There is great difference of opinion as to this species, and indeed it has not been satisfactorily determined.

As has been shown, Dr. Binney confounded it with *H. lævigata*, by others it has been placed with that species in the synonymy of *H. fuliginosa*, and Pfeiffer has recently determined it to be the species described by W. G. Binney as *H. friabilis.*

Mr.. Binney (Suppl. p. 106) considers the Mexican *H. caduca Pf.* allied to, if not identical with it, and refers to "Mexican specimens of *lucubrata* preserved for many years in the Philadelphia Academy" as agreeing perfectly with that species.

I have critically examined the three specimens at the Academy; they are attached to a card, and labelled, by Mr. Phillips I believe, "Helix lucubrata Say, Mexico. N. H. Disseminator, vol. ii. p. 229." One of the specimens, that of which the base only is visible, is I think a pale var. of *H. fuliginosa*, but the other two differ from all the forms of the group, inclu[illegible] *caduca Pf.*, which I have seen. Th[illegible] specimen[illegible] is young of the same) of which b[illegible] pper an[illegible] and aperture can be fully seen, agrees *entirely* with Say's description of *H. lucubrata*, so much so as to favor the conclusion that it is an authentic example, if not indeed his type. It is appropriately compared with *H. lævigata Raf.* (*inornata Say*), but as Say remarks, the umbilicus is "much larger," nearly equal to that of *H. fuliginosa*, and the aperture "more accurately rounded," being somewhat wider, but much like that of Griffith's species. The shell is in color darker above than usual in *H. lævigata*, the darker shade extending over the periphery and terminating abruptly, where the paler color of the base prevails. The margin of the last whorl, at the suture, has indications of a line of a deeper reddish brown color than that of the rest of the upper surface of the shell.

The incremental striæ are well defined "wrinkles," but of irregular elevation, and not equidistant. The shell has five whorls, less rapidly increasing than in *H. lævigata*, and the following are its dimensions:—

Diam. maj. 26, min. 23, Alt. 11½ mill. Ap. 12 mill. long. 12 lat.

This Academy specimen differs from examples of *H. caduca Pf.* received from Mr. Cuming and M. Sallé in the following particulars; it is more strongly "wrinkled," of darker color above, and the aperture is more orbicular—the last whorl is more ventricose.

A specimen of *H. caduca* in my cabinet, with 5¼ whorls, measures, Diam. maj. 26, min. 21½, Alt. 10 mill. Ap. 10 mill. long. 13 lat. The color is scarcely paler at the base than above, the umbilicus is the same as in the Academy shell, and the whorls increase in the same proportion. Several young shells have the same but more plainly discernible dark sutural line.

Considering the Philadelphia specimen to be the *H. lucubrata Say*, I cannot pronounce it to be identical with *H. caduca*, but intermediate between it and *H. lævigata*—more closely allied to the former, and possibly a variety of it, certainly distinct from the latter and from *H. fuliginosa*, and *H. friabilis*.

Helix septemvolva Say.

This species was described by Say in Nicholson's Enc. in 1816,* and the description was republished in the Journal of the Philadelphia Academy in May 1818; it is as follows:—

"P. SEPTEMVOLVA.—Shell much depressed, discoidal; spire not prominent; whorls seven, perfectly lateral, compressed, depressed, and marked with conspicuous lines and grooves above, a projecting carina on the upper edge of the body whorl, beneath which the lines and grooves are obsolete; aperture subreniform, not contracted; lips equal, elevated, outer one reflected, regularly rounded so as to describe two-thirds of a circle; pillar lip projecting inwards, into an angle or tooth, which is concave beneath; beneath the four exterior volutions equally prominent, transverse diameters equal to those of the upper surface; umbilicus central, moderate, attenuated to the apex so as to exhibit the remaining volutions.

Breadth, female, two-fifths—male, three-tenths of an inch. Inhabits Georgia and East Florida. Cabinet of the Academy. A very common shell in many parts of Georgia, particularly the sea islands, also in East Florida. We found them numerous under the ruins of old Fort Picolata on the St. John River, and on the Oyster-shell Hammocks, near the sea, and in other situations under decaying palmetto logs, roots, &c."

This is a very variable shell, and the species of the group to which it belongs, inhabiting the Southern States and adjacent Islands and Keys, as well as the Bahama and Bermuda Islands, have not been accurately defined and determined.

Say, it may be inferred, considered all the individuals which came under his notice from the United States as belonging to *septemvolva*. He sent specimens to Férussac, and was informed, by letter in reply dated 15th July, 1820, that the species had been figured and described in 1816, by Megerle de Muhlfeldt in the Berlin Magazine, under the name of *H. cereolus*.

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* Mr. Binney mentions in the Preface to the reprint of Say's writings on the Conchology of the United States, that he had not been able to find the first edition of this work, but gives its date 1816, on the authority of Férussac, Mag. de Zool. 1835.

The description by Muhlfeldt (Berlin Mag. VIII. p. 41, pl. ii. fig. 18, 1816) is short, and the figure indifferent,—I subjoin copy of the former:—

> "T. orbiculari, umbilicata, utrinque planata, alba, oblique subcostata, marginata, unidentata."

The dimensions given are Diam. 4½ lines, Alt. about 1 line. In some remarks (in German) Muhlfeldt mentions that the shell has eight whorls, and that it was most probably from the West Indies, specimens having been found with a lot of shells from thence.

Deshayes (in Fer. Hist. I. p. 1839?) remarks in connexion with *H. septemvolva:*

> "Il est bien à présumer que l' *H. cereolus* de Megerle est la même que celle-ci; cependant sa description trop courte et sa figure médiocrement exécutée, nous laissent quelques doutes sur son identité avec celle que nous venons de décrire."

Deshayes (in Fer. Hist. I. p. 6, pl. 72, fig. 13) described *H. microdonta* as follows:

> T. discoidea, planulata, albo-grisea, flammulis obliquis fuscis subrubescentibusve ornata; superne spira depressissima, subtus profunde lateque in ambitu umbilicata, tenuissime et regulariter striata; apertura obliqua, marginata, ovato-semilunari; labio dente obliquo minimo prædito.
>
> *Hab.*—L'Amerique méridionale? l'isle de Cuba? communiquée à M. de Férussac par M. d'Orbigny.
>
> Nous n'avons sous les yeux que le seul individu de cette espèce que possédoit la coll. de M. de Férussac; nous le regardons comme appartenant à une espèce bien distincte, intermédiaire par ses caractères entre l'*H. septemvolva* et le *lingulata* (*paludosa Pf.*) se rapprochant cependant plus de cette dernière que de l'autre. "Elle est orbiculaire, deprimée, à spire à peine saillante au-dessus du dernier tour; mais elle n'est pas concave en dessus; en dessous la coquille est percée d'un ombilic profond et s'elargissant subitement à son entrée, parce que le dernier tour

se déroule par une spire plus large que ceux qui le précèdent. Les tours de spire au nombre de sept sont convexes, couverts de stries fines, regulieres, rapprochées, plus profondes sur le côté supérieur que dans la partie ombilicale: elles s'attenuent insensiblement en passant du dessus à la circonférence et de la circonférence au-dessous. L'ouverture est très oblique, le bord droit, épaissi en dedans, est renversé en dehors; il se continue par ses extremités en un bord gauche, sur le milieu duquel se relève une petite dent oblique et courbée que l'on voit tout entière en dehors lorsque l'on regarde l'ouverture de profil. Cette coquille est d'un blanc grisâtre, et elle est ornée de flammules longitudinales, etroites, irrégulièrement distribuées et d'un brun pâle et rougeâtre.

"Elle a 10 mill. de diamètre et 4 de hauteur."*

Pfeiffer (Mem. i. p. 409, 1848) assigns *H. microdonta* to the Bermudas and Texas, "teste coll. Menkeana."

Muhlfeldt and Deshayes did not know the localities from which their specimens came—the figure and description of the former author are unsatisfactory, and the latter described from a single individual, and gives a figure which is by no means conclusive. Under such circumstances, considering that the species of the group to which *H. cereolus* and *H. microdonta* belong are very variable, it is not surprising that difficulty should be now experienced in determining them.

When in Bermuda, in 1852, I collected a large number of specimens of a finely striated shell, pretty closely agreeing with the description of *H. microdonta Desh.;* but Mr. Shuttleworth, in 1855, was disposed to think it distinct, and proposed to call it *H. delitescens*, under which name it has been extensively distributed, but nothing published about it.

In 1853, Mr. S. sent me specimens labelled "*H. microdonta* Desh., Key West, Florida," which differ very much from the Bermuda shell, having sharp and more distant striæ, and an internal lamella. I also received from the same source examples of *H. volvoxis* Parr., from Hopeton, Ga. Both these speices were at that time apparently unknown to American conchologists. Dr. Binney makes no mention of them in the Terr. Moll.; and Dr. Gould even omits them in vol. iii. (1857), although he inserts descriptions of additional species, "so as to embody all the species at present known." Mr. W. G. Binney admits them in the Supplement (1859) to his father's work.

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* See facsimile of the figure to which Deshayes refers, in W. G. Binney's Supp. to the Terr. Moll., pl. 78, fig. 23.

In 1859, Mr. Wm. Cooper collected at Nassau, New Providence, numerous specimens of a species apparently identical, though varying somewhat from that which inhabits Bermuda.*

Neither Mr. Binney nor I have received, or even seen specimens from Texas of any of the species belonging to this group.

Before examining the strictly North American species in detail, I may explain that I consider *H. cereolus* Mühl. and *H. septemvolva* Say to be distinct,—that the Bermuda shell is the *H. microdonta* Desh, and that the species from Florida, now known here as *microdonta*, has not been described. In the following pages I describe it under the name of *H. Carpenteriana.* As to *H. volvoxis* Parr. I think that it is no more than var. of *H. septemvolva.*

H. septemvolva, as *described* by Say, cannot be misunderstood,—it occurs only, I believe, in East Florida, and especially at and in the vicinity of St. Augustine,—for many fine specimens collected there, I am indebted to Mr. O. M. Dorman. It is variable in size, but distinguished by its sharp carina and open umbilicus. In a specimen with 8½ whorls (diam. maj. 14 mill.), the width of the actual umbilical opening is 2 mill. The penultimate beneath is generally half covered by the last whorl. The very small var., called the *male* by Say, is comparatively rare.

The four examples preserved at Philadelphia, said to be authentic, are of the form described.

---

* *H. paludosa* Pf. (*lingulata* Fer.), an inhabitant of Cuba and Jamaica (rare in the latter island), belongs to this group, bnt is readily distinguished by its rugose upper surface, and small parietal tooth which is unconnected with the margins of the peristome.

The following are measurements of large and small specimens in my cabinet:—

Diam. maj. 14, min. 12½ mill., Alt. 3 mill. anf. 8½.
" " 7½ " 6½ " " 2½ " " 7.

Associated with *septemvolva*, Mr. Dorman found not only the shell described by Pfeiffer as *H. volvoxis*, but an intermediate form, in which the flat upper surface and carina of the former, are combined with the more tumid character, and breadth of the last whorl beneath of the latter. In many specimens the uniform opaque light color of the base of each whorl is a striking feature. Mr. Dorman informs me that in some places in St. Augustine the three forms are found together, but that *septemvolva* and *volvoxis* generally inhabit different localities.

Helix volvoxis Parreyss.

Pfeiffer's description of this species is as follows:—

T. umbilicata, orbiculato-convexa, tenuis, rufo-cornea, pellucida, regulariter costulato-striata; spira brevissima, convexa; anfr. 7 convexi, regulariter accrescentes, ultimus reliquis superne vix latior, angulatus, infra angulum inflatus, striatus, nitidus; umbilicus latus, regularis, anfractu ultimo latissimo, reliquis regulariter decrescentibus; apertura majuscula, reniformis; perist. intus callosum, reflexum, marginibus callo brevi, triangulari, dentiformi junctis. Diam. maj. 9, min. 8; Alt. 4, mill. Habitat in America boreali: Georgia, Florida.

Obs. Hanc speciem, a præcedente (H. cereolus Mühl.) toto cœlo diversam, sæpius ex America nomine II. septemvolvæ Say accepimus.

This shell is very generally labelled in cabinets *H. septemvolva*, but I entertain great doubts, looking at my extensive suite of specimens, as to its specific difference.

The form described by Pfeiffer is common in St. Simon's Island, Ga., whence I have examples collected by Mr. Postell.

It varies in size,—the following are the measurements of a small specimen, having 6½ whorls:—

Diam. maj. 7½, min. 6½; Alt. 3 mill.

Helix cereolus Mühlfeldt.

I have already quoted the original description of this species at page 133, and refer to the copy of the author's unsatisfactory figure, published by W. G. Binney in his Suppl. pl. 77, fig. 23.

The *whitish* shell, *H. cereolus Mühl.* var. *laminifera* of W. G. Binney's catalogue in the Philadelphia Proceedings, which we have in our cabinets, found by Lieut. Wurdeman at Indian River, E. Florida, and also from Indian Key, belongs in my opinion to this species. The annexed figures,* double the natural size, of the base of *septemvolva* (fig. 1.) and *cereolus* (fig. 2.) show the striking differences in the characters of the umbilicus, and of the aperture, and also that Mühlfeldt's figure, especially of the umbilicus, agrees rather with the latter than the former.

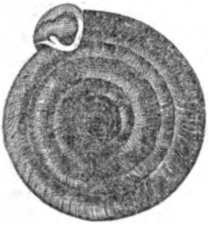

FIG. 1.

H. septemvolva Say.

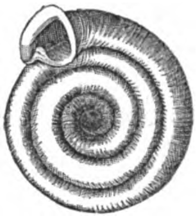

FIG. 2.

H. cereolus Mühl.

The umbilical opening, in specimens of about equal size, is only half the width of that in *septemvolva;* the last whorl is wider, especially towards its termination at the aperture, more inflated, and rather less acutely carinated. The aperture is more orbicular, more contracted, and the outer lip more expanded and acutely reflected, and at its junction below with the pillar lip more closely appressed to the last whorl.

---

* The woodcuts were executed by Waters & Son, 90 Fulton Street, New York, admirable figures of the shells having been previously photographed, in their establishment, on the block. I gladly avail myself of this opportunity of calling the attention of naturalists to this valuable method of securing accurate figures.

This shell has generally a more or less developed internal lamina, commencing on the parietal side of the inner fourth of the last, and running round rather obliquely within from two-thirds to three-fourths of the penultimate whorl,—revolving in fact nearly once round the shell.

In some specimens the penultimate whorl below is partially covered by the last, as in *septemvolva.*

This species, which I consider distinct from *H. septemvolva* Say, has from 7 to 8 whorls, and measures as follows:—

Diam. maj. 14, min. 12½, Alt. 3½ mill. (large specimen.)
" " 9, " 8 " 2½ " (small do.)

Dr. Gould (Terr. Moll. Vol. III. p. 31) refers to the vertical series on Plate XXXVIII as reprenting the typical form of *H. septemvolva* Say, but the lower figure, showing the base, is certainly not of the shell *described* by Say, rather of that which I call *H. cereolus.*

Helix Carpenteriana nov. sp.

SYNONYMY.

Helix *microdonta Pfr.* Mon. 1. p. 499 ex-parte?	1848.
—— ———— *W. G. Binney,* Notes on Amer. Land Shells, Phila. Proc.	1858.
—— ———— " Suppl. Terr. Moll. p. 91,	1859.

T. umbilicatâ, orbiculatâ, corneâ vel pallide rufescente, superne planâ, oblique et argute costulatâ, subtus convexâ, leviter striatâ, nitidâ, maculis opacis, indistinctis, sæpe ornatâ; suturâ valde impressâ; anfr. 5½–6½, ultimo ad peripheriam superne subangulato, ad aperturam breviter sed subito deflexo, gibbosulo, scrobiculato-constricto, pone aperturam tumido, costulato, basi dilatato, laminâ internâ albâ in pariete columellari, pone aperturæ insertionem sitâ; aperturâ perobliquâ, lunari; perist. intus calloso, incrassato, reflexiusculo, marginibus lamellâ dentiformi triangulari junctis.

Shell umbilicate, orbicular, horn-colored or pale rufous, above flat, obliquely and acutely ribbed, beneath convex, slightly striated, shining, often ornamented with indistinct white spots; suture deeply impressed; whorls 5½–6½, the last subangular at the periphery, shortly but suddenly deflected at the aperture, gibbous, scrobiculate, constricted, tumid behind the aperture, and ribbed, base dilated, with a white internal lamina on the columellar wall near the point of attachment of the aperture; aperture very oblique, lunate; perist. callous within, thickened, little reflected, the margins joined by a triangular dentiform lamella.

Diam. maj. 10, min. 9, Alt. 4 mill. anfr. 6½.
" " 7, " 6, " 3 " " 5½.

Habitat.—Key Biscayne, Florida, Wurdeman! Key West, Shuttleworth. South Florida, Dr. Cooper! Sea Islands, Florida, Bartlett. Lake Harney, Fla., E. Norton!

Remarks.—This species has been hitherto named *H. microdonta* Desh. in American Cabinets, and I have indeed so distributed it, but I believe erroneously. It is readily distinguished from all the other species of the group by its strong acute rib-like striæ, and the peculiarity of the outer whorl. About the last third of it, behind the aperture, is ribbed and tumid,—the whorl is then rather abruptly contracted, becoming narrower above, and flattened and slightly striated beneath, but again, as it passes towards and beneath the aperture, dilated, and convex. This change of form gives to the last whorl a distorted appearance. The internal lamina is on the columellar wall of the contracted and flattened portion of the last whorl, and runs obliquely, in the direction of the aperture, attaining a length in a large specimen of about 6 mill. The character of the aperture is most like that of *H. cereolus*, but in that species the last whorl has none of the peculiarities above described. The internal lamina is found in a majority of specimens, but not in all; it can generally be seen through the outer wall of the shell.

In my Cabinet are specimens, received from Mr. W. G. Binney, belonging to this species, having all the peculiarities of the last whorl, but being rather delicately striated,—they are extremely small, and were, I believe, from Dr. Binney's Cabinet; the habitat unknown. The measurements are,

Diam. maj. 5½, min. 5, Alt. 2 mill. anfr. 5.

The variety from Lake Harney is dark horn-colored, thin, translucent, acutely ribbed, but with little of the peculiarities of the last whorl prevailing in the Key Biscayne specimens, and in the small variety already noticed,—the whorl, scarcely flattened and contracted as in those, is nearly of uniform size beneath.

Several years ago I received from the late Mr. Clark of Cincinnati, about a dozen shells of the species now under consideration, labelled by Mr. Bartlett "H. septemvolva Say, Matanzas, Cuba," but agreeing with specimens sent to me by Mr. Shuttleworth as *H. microdonta* from Key West. I communicated them under the latter name to M. Poey, who seeing that live examples have not been found in Cuba, doubtfully refers the species to the fauna of that island. (Vide Mem. V. II. p. 49 and 90.)

This species I dedicate to my friend Mr. P. P. Carpenter, author of the "Report on the Present State of our Knowledge with regard to the Mollusca of the West Coast of North America," &c., &c., whose labors in the United States have added much to the value of many of our public and private cabinets.

NOTE.—H. MICRODONTA DESH.—With respect to this species, looking at his description, I cannot doubt but that the author refers to the Bermuda shell, now somewhat extensively known in cabinets as *H. delitescens* Shutt. I should mention that Mr. Shuttleworth, in his latest correspondence with me on the subject, expressed some doubt as to treating the Florida shell as the species described by Deshayes. Those doubts may account for the non-publication of *H. delitescens*.

The shells found in abundance by Mr. W. Cooper, at Nassau, agree rather with those from Bermuda than any other. But in one with very fine striæ (anfr. 6½), and in another (anfr. 7), with the striæ rather coarse, I have detected the internal lamina. In both, the outer whorl is without the characteristic features of *H. Carpenteriana.* Among a considerable number of specimens I found the lamina only in the two referred to. I have never seen it in the Bermuda shell, of which I have examined very many individuals.

The Bermuda shell was known to Say. He wrote a description, which was, however, never published. The following is a copy from the original MS. in the possession of Mr. Binney:

"H. CHEILODON.—Discoidal, labrum reflected—a tooth on the labium. Inhabits Bermuda.

"Shell discoidal, the spire very slightly convex, whorls nearly 6, with elevated striæ across, forming somewhat regular intervening grooves,—body whorl angular above its middle, beneath which it is convex, and only wrinkled, the grooves terminating at the angle or carina,—umbilicus dilated, exhibiting the volutions to the apex: aperture rather longer than wide,—labrum contracting the aperture a little, reflected, excepting towards its superior termination, and declining a little at its junction with the preceding volution: labium with a short, oblique tooth. Breadth, ⅖ inch. The late Mr. Stephen Elliott presented to me this shell, which he obtained from Bermuda. It is more completely fastigiate than even *H. septemvolva* Nob., and there is no obvious calcareous deposit on the labium, as in that species."

It may be remarked that Say's description agrees almost entirely with that of Deshayes of *microdonta*,—in specimens from Bermuda, not completely full grown, but with reflected lip, the labial tooth is of the character mentioned by Say.

HELIX FASTIGANS L. W. Say.—In my Remarks (Ann. Lyc. Vol. VI. p. 283) on *H. fatigiata* Say, I noticed that the name was originally written by Say correctly, viz. *fastigiata*, and that Pfeiffer had remarked to the effect that the former word is unmeaning. Mrs. Say, anxious that this long-standing typographical error should be removed, expresses her wish that the specific name of the species should be altered to *fastigans*, that of *fastigiata* having been applied by Hutton to another.

Helix porcina Say.—I commented on this species in Ann. Lyc. Vol. VI. p. 344, suggesting that Say's description applies rather to a young *H. inflecta*, than *H. hirsuta*, but anticipating that "further researches will prove this to be a distinct species." I now learn that *H. hispida* L. inhabits some parts of Nova Scotia, and also Canada East; and Dr. Gould suggests—as indeed seems highly probable—that *H. porcina* is identical with it.

XVIII.—*Description of a* New Species *of Bird of the Genus* Phaeton, *also of a* New Species *of Humming Bird of the Genus* Heliopaedica.

By Geo. N. Lawrence.

Read April 23, 1860.

Phaeton flavo-aurantius.

The general plumage is of a rich salmon color, rather paler below and on the ends of the primaries; a line of deep black runs along the side of the head, over the eye, and extends before and below it in the shape of a crescent; a band of black crosses the wing, beginning near the shoulder, occupying the ends of the middle coverts, and all of the secondaries and tertiaries, except a small portion of their ends, where they are salmon color: the scapularies are marked lengthwise with a curving band of black, which crosses both webs; the first three primaries are black on their outer webs, and on the inner, next the shaft, from their bases to within about one and a half inches of their ends; the fourth is black for the same distance, but not on the inner web; the fifth has only a narrow line of black along the shaft, on the outer web for a short distance from its base; the shafts of the primaries are black, except for a short space at their ends, where they are white; the long feathers on the flanks are broadly striped down their centres with greyish black; some of the upper tail coverts are irregularly marked with black; the tail is salmon color, the elongated central feathers deepest in color, except near the end, where they are paler; the shafts of all are black on the upper surface, with a small terminal portion white; on the under surface, the shafts of all the tail feathers are white; the upper mandible is of a dusky greenish-olive, but pale olive yellow along the ridge, the cutting edges, and at the point; the lower mandible is pale olive yellow, with a brownish mark on the side for two-thirds its length; tarsi and basal half of toes orange yellow, remaining portion and claws black.

Length about 33 inches; wing 11¼; tail 21; tarsus 1⅜; middle toe and claw 1⅝; bill 2.

Habitat.—Unknown.

It was bought from a dealer several years ago, who was under the impression that it had been obtained somewhere in the Pacific Ocean, but could give no information about it, except that it had been brought in by a sailor.

I gave a short description of the above bird in Vol. IX. p. 886 of the Pacif. R. R. Reports, under *P. flavirostris*, as probably being that species in an abnormal stage of plumage; I was led to this opinion, because a bird apparently the same is figured by Reichenbach, Syst. Av. pl. 30, as *flavirostis.* I had strong misgivings whether it was assigned its true position, and whether it was not really a distinct species; my suspicion of its being so, has been strengthened by the account of *P. flavirostris* given by J. L. Hurdis, Esq., in The "Naturalist in Bermuda," 1859, which states the plumage to be white, the male tinged with carmine; great numbers were obtained, on one occasion a small reward being offered for them, between forty and fifty were brought alive, but none are mentioned as differing in color. In the Spring of 1859, Dr. H. Bryant visited several breeding stations in the Bahamas, an account of which he has published in the Proc. of the Bost. Soc. of N. H. of Sep. last. He also saw and obtained quite a number, which he states agreed generally with my description of that species in the Pacif. R. R. Report. He says the males and females do not differ in appearance, and the different specimens "varying only in the shade of salmon, which is always deepest on the long tail-feathers, and next on the back and hind neck." This is probably the "carmine or roseate hue" spoken of in the Naturalist in Bermuda, and which is no doubt evanescent shortly after death, as there is no appearance of it in the specimens presented by Dr. B. to the Smithsonian Institution, where I lately saw them, nor does it remain in my own specimen of *flavirostris* from Cuba, which appears to be fully adult. Dr. Bryant in his description says, the white on the three outer primaries diminishes in extent from the 1st to the 3d; this is so in my specimen from Cuba, the white tip on the 1st primary being but half an inch in extent, less on the next, and on the 3d the black reaches the end; in the species now described, the light colored ends of these three primaries are nearly alike, or about one and a half inches in extent. Dr. Bryant examined the bird now described (after his return from the Bahamas), and united with me in the opinion of its distinctness from the species which he obtained.

If *flavirostris* ever attains the uniform salmon-colored plumage of the bird now described, it surely would be when adult and at the time of breeding; yet of the large numbers procured at Bermuda and the Bahamas, none were similarly colored.

The bill in the present species is narrower than that of *flavirostris*, and the upper tail coverts marked with black, which are pure white in the one last named.

Heliopaedica castaneocauda.

Male. Front, crown, chin and a continuous line running below and beyond the eye, black; a white line extends backward from behind the eye, and borders on the black; the upper plumage is grass-green; tail dark chesnut-red, as are also the shafts, the lateral feathers are somewhat lighter in color, the two central feathers have a margin of golden bronze extending entirely around them, the other tail feathers have a narrow edging of dull black encircling their ends; wings purplish-brown; throat brilliant grass-green; sides and under wing-coverts grass-green; abdomen and under tail-coverts dull rufous; tarsi clothed with pale rufous feathers; bill flesh-color for three quarters its length, with the end black; feet blackish-brown.

Length 3½ inches; alar extent 4¾; wing 2; tail 1¼; bill $\frac{11}{16}$.

Habitat.—Cape St. Lucas, South California.

Remarks.—This species is a near ally of *H. melanotis* Sw., but differs in the head being black instead of sapphire-blue, in the green-plumage being of a much darker shade, the abdomen rufous in place of grey, and in the dark chesnut color of the tail, which is mostly black in *melanotis*.

The specimen belongs to the Museum of the Smithsonian Institution, and was but lately received from Mr. John Xantus.

XIX.—*Descriptions of* NEW SPECIES *of the Genera* ACHATINELLA, *and* PUPA.

BY W. NEWCOMB, M.D., of Oakland, Cal., Corresponding Member.

Read April 9th, 1860.

Achatinella Kauaiensis, nov. sp.

T. imperforatâ, dextrorsâ, trochiformi, solidâ, valide striatâ et decussatâ, superne nigro-fuscâ, carinâ et basi albo-luteâ; suturâ crenulatâ;

anfr. 7 plano convexis, ultimo in medio valde chordato-carinato; aperturâ irregulariter quadratâ; columellâ brevi, tortuosâ, uniplicatâ.

Shell imperforate, dextral, trochiform, solid, strongly striated and decussated, above blackish-brown, the carina and base dirty-white colored, suture crenulated; 7 whorls, flatly convex, the last with a cord-like keel in the middle; aperture irregularly quadrate; columella short, twisted, with one fold.

Long. $\frac{9}{10}$, lat. $\frac{8}{10}$ poll. Aperturæ long. $\frac{4}{10}$, lat. $\frac{5\frac{1}{4}}{10}$ poll.

Habitat.—Kauai, Ins. Sandwich.

My cabinet, and cabinets of Rev. E. Johnson and Rev. Mr. Rowell.

Remarks.—For this interesting species the scientific world is indebted to the researches of the Rev. E. Johnson, of Waoli, Kauai.

It belongs to the same group as *A. obesa* Nob. and *A. melanosis* Nob., but the size is so much greater, as to induce a hope that further research will develope intermediate species.

Pupa Rowellii, nov. sp.

T. perforatâ, oblongo-ovatâ, corneo-castaneâ, nitidâ, pellucidâ, subtiliter striatâ; apice obtusâ; anfr. 5 convexis; aperturâ truncato-ovatâ, dentibus 4 instructâ, 1 prominente, plicato, ad columellam, 3 in faucem profunde immersis; perist. vix reflexo.

Shell perforate, oblong-ovate, dark horn colored, shining, translucent, finely striated; apex obtuse; whorls 5, convex; aperture truncately ovate, armed with 4 teeth, one prominent and plicate on the columella, 3 deeply seated within the aperture; peristome slightly reflected.

Long. 2, lat. 1 mill.

Habitat.—Near Oakland, California.

My cabinet, and cabinet of Mr. Rowell.

Remarks.—This approaches nearest to *P. ovata* Say, from which it differs, however, in many of its details. I am not aware that any species of this Genus has heretofore been found in this State.

I take pleasure in dedicating this species to the Rev. Mr. Rowell of San Francisco, an active collector, and enthusiastic conchologist.

XX.—*On the* MOLLUSCA *of Peconic and Gardiner's Bays, Long Island, New York.*

BY SANDERSON SMITH.

Read December 5th, 1859.

PECONIC and GARDINER'S Bays, which together indent the extremity of Long Island to the depth of more than twenty miles, offer especial advantages for the study of the Invertebrata of our Atlantic coast. Situated at the junction of the Atlantic and Boreal Molluscan Provinces of Forbes, they have a greater proportion of species common to both than any other locality with which I am acquainted. Out of the 96 species, excluding Tunicata, occurring in the bays, 62 or 64·6 per cent. pass Cape Cod, and including five species found about Montauk Point, but not in the bays, the proportion for the east end of Long Island becomes 67 out of 101, or 66·3 per cent. Stimpson gives only 27 other species as found on both sides of the Cape, making the entire number 94, of which 71·3 per cent. occur in the bays and around Montauk Pt.

Of the 96 species of the Bays, 1 is a Cephalopod, 45 Prosobranchs, 1 Pulmonifer, 3 Tectibranchs, 1 Nudibranch, and 45 Lamellifers. Besides these, at least 18 or 19 species of Tunicata exist, making the total number of Mollusca about 115.

Five species, *Chemnitzia seminuda*, *C. bisuturalis*, *Mytilus corrugatus*, *M. lævigatus*, and *Leda sapotilla*, have not before, so far as I am aware, been found south of Cape Cod. Four species, a *Cæcum*, a *Rissoa*, a *Skenea*, and an *Æolis*, besides most of the Tunicata, appear to be undescribed. Thirty-five species, *Loligo illecebrosa*, *Æolis* ——, *Chemnitzia producta*, *C. bisuturalis*, *Vermetus radicula*, *Cæcum pulchellum*, *Cæcum* ——, *Skenea*, ——, *Rissoa* ——, *Eulima subangulata*, *Columbella Gouldiana*, *Scalaria lineata*, *S. clathrus*, *Cerithiopsis Emersonii*, *Cer. terebellum*, *Cerithium nigrocinctum*, *C. Greenii*, *Pleurotoma cerinum*, *Natica pusilla* (Say, *non* Gould), *Anomia aculeata*, *Mytilus decussatus*, *M. corrugatus*, *M. lævigatus*, *Nucula proxima*, *Leda limatula*, *L. sapotilla*, *Tellina tenta*, *Solecurtus bidens*, *Solemya borealis*, *Cyprina Islandica*, *Cardita borealis*, *Astarte mactracea*, *Montacuta bidentata*, *Cumingia tellinoides*, and *Thracia Conradi*, are either not mentioned at all, or only doubtfully, by Dekay, as New York species. *Col. Gouldiana*, *Solemya borealis*, and *Thracia Conradi*, may still be considered doubtful, as only worn specimens or fragments were obtained.

Five species, *Astarte castanea*, *Cyprina Islandica*, *Mesodesma arctatum*, *Purpura lapillus*, and *Buccinum undatum*, were found about Montauk Pt., but not in the Bays. A closer examination and the use of the dredge around Montauk Pt. would probably very largely increase the list of species belonging to the eastern extremity of Long Island.

With this brief summary, and premising that my dredging researches have been almost entirely confined to the immediate neighborhood of Greenport, at the junction of the two bays, I commence a short account of the species found, with notes on the animals of some of them.

Cephalopoda.

1. *Loligo illecebrosa Lesueur.* Very abundant and large. In some specimens the pen is nearly a foot long. The spawn

occurs sometimes in very large masses. In June or July, 1858, I saw on the beach near Southold, in Peconic Bay, a heap eighteen inches or two feet in diameter, which must have been the product of a large number of individuals. Other smaller heaps were to be seen around. I have never seen the species so abundant as on the day that this was observed. More than a thousand, some of the largest size, were lying within a very small space, having been drawn up in a seine. They appear to prey upon each other, as I have found the jaws and eyes of small ones in the stomach of a larger individual. Another had several fragments of eelgrass (*Zostera marina*) in its stomach. The lingual ribbon is about half an inch long in individuals of the ordinary size.

Prosobranchiata.

2. *Ranella caudata Say.* Moderately abundant. On sandy and pebbly bottoms—to 4 to 10 fathoms. Generally smaller than Gould states, in the Bay, but those from the Sound are frequently an inch long. The animal has the lower surface of the foot yellowish white; upper surface translucent yellowish white, thickly mottled with opaque yellow. Foot square in front and obtusely pointed behind: about three-eighths the length of the shell. Upper surface of the body, as well as the tentacles, translucent white, thickly mottled with opaque white. Tentacles short and thick, bearing the black eyes on their outer sides at about three-fourths their length, and diminishing suddenly in thickness beyond them. This description is principally drawn from a single specimen, for though I have kept many of them alive, and sometimes for a week or two at a time, I have very rarely succeeded in seeing any part of the animal but the bottom and edge of the foot.

3. *Pyrula carica Brug.* Abundant and large. Seven inches is a common length, and I have seen it eight inches long. The spawn of this, as well as of the following species, is

found in a fresh state both in the spring and autumn. The state of development was not particularly noted in spring (in April), but as far as my recollection goes, it did not differ materially from that of specimens taken early in November, and was far less advanced than in those collected about the 1st of Feb., appearing to indicate that the animal spawns twice a year. In spawn of the two species, taken at the same time and in the same locality, about the 6th of November, this species was only about one-tenth of an inch long, whilst *P. canaliculata* was of twice that length, and much more developed. A corresponding difference was to be seen in specimens obtained about Feb. 1st, though their respective sizes were then more than doubled. The membranous cases, containing the ova, are, in this species, sharp-edged, and marked with about a dozen radiating ridges on the sides; whilst *P. canaliculata* has the sides smooth and parallel, connected by a membrane an eighth of an inch wide, crossed by twelve or fifteen ribs. The lingual ribbons of both species are nearly three inches long; containing, in this species, about 130 rows of teeth. Low water to 10 faths. At the latter depth I have never dredged it more than half an inch long alive.

4. *Pyrula canaliculata Brug.* Abundant and generally larger than Dekay and Gould state. Seven inches is a common length, and I have found them considerably larger. I have never found it here in water more than a few feet deep.

5. *Buccinum plicosum Menke.* Moderately abundant and large. High water to 10 faths.

6. *Nassa obsoleta Say.* Very abundant. Littoral.

7. *Nassa trivittata Say.* Abundant. The three bands of color are generally present. Specimens from the mouth of Napeague Harbor, which is, however, a little beyond the strict limits of Gardiner's Bay, and exposed to a somewhat heavier surf, are almost invariably highly colored and conspicuously banded. I have a dead specimen from here nearly an inch long. The animal is much lighter colored than that of the pre-

ceding species, the upper surface being covered with small slate-colored spots on a nearly white ground. Foot white below, nearly as long as the shell, horned in front, and with two tentacular filaments behind; whilst in *N. obsoleta* it is bluntly pointed behind, and not so narrow. Tentacles about one-third the length of the shell, bearing the black eyes on their upper side, at the first third of their height, and narrowing suddenly beyond them. Trunk mottled like body, capable of being extended half the length of the shell beyond it. — 2 to 10 faths.

8. *Columbella avara Say.* Moderately abundant. Low water (on piles of a pier), to 10 faths.

9. *Columbella Gouldiana Agassiz.* Several dead specimens, considered by Mr. Wm. Cooper to belong to this species, occurred amongst accumulations of *Cerithium Sayi*, and *Venus gemma.*

10. *Columbella lunata Sowerby.* Moderately abundant. The animal has a conspicuous grey siphon, more than half the length of the shell. Foot white below, very narrow, capable of being extended to the full length of the shell. Eyes near base of tentacles. When in confinement, it often floats at the surface of the water with the foot upwards. Very active. In mud and sand from low water to 10 faths. Numerous specimens were found in November crawling on *Tubularia larynx* attached to the piles of a pier, below low water mark, in company with *C. avara*, *Cerithium Greenii*, *C. nigrocinctum*, *C. Sayi*, *Nassa trivittata*, *N. obsoleta*, and *Littorina rudis.*

11. *Pleurotoma cerinum Kurtz & Stimp.* Rare. Only dead shells found.

12. *Pleurotoma plicatum Adams.* Not so rare as the preceding. The animal has the foot white below, not very narrow, capable of being extended to two-thirds the length of the shell. Tentacles short, bearing the eyes near their extremity, and suddenly narrowing beyond. Siphon yellowish, short. In two faths. mud, and dead amongst accumulations of *Cer. Sayi*, etc.

13. *Natica heros Say.* Rare and very small in the Bays. On the Sound, only a mile or two distant, both this and the following species are very abundant, and commonly more than three inches in diameter. On the south side of Montauk Point fragments of specimens four or five inches in diameter are common. — to 4 to 10 faths.

14. *Natica duplicata Say.* Rare and very small. — to 3 to 10 faths.

15. *Natica triseriata Say.* Moderately abundant and rather large. 2 to 10 faths.

16. *Natica pusilla Say*, non Gould. Thirty or forty living specimens of the same species dredged by Messrs. Prime & Stimpson in Buzzard's Bay, and by Lt. Kurtz in S. Carolina, were dredged on one occasion in four or five faths. sand in Gardiner's Bay. Dead specimens had previously occurred, rarely, in the Bays.

17. *Natica immaculata Totten.* A few dead specimens. Several very large ones were found about Napeague Point, just outside of the southern extremity of Gardiner's Bay.

18. *Eulima subangulata Stimpson?* Eight or ten dead specimens dredged at various times in ten faths.

19. *Chemnitzia producta Stimpson.* Rare. Only dead specimens among accumulations of *Cer. Sayi*, *Venus gemma*, &c.

20. *Chemnitzia fusca Stimpson.* Rare. Found with preceding.

21. *Chemnitzia seminuda Stimpson.* Numerous specimens dredged in two faths. mud.

22. *Chemnitzia bisuturalis Stimpson.* Rare. Animal white. Foot about half the length of the shell. Tentacles short and thick, about quarter the length of the shell. Eyes black, between bases of tentacles. Under stones at low water mark.

23. *Chemnitzia trifida Stimpson.* Moderately abundant at low water mark under stones, and on the inside of dead valves of *Pecten irradians*, together with the preceding species, and *Cer. Sayi.* The animal is entirely white. Tentacles about

quarter the length of the shell, regularly tapered, not very slender. Eyes minute, between and a little behind the tentacles. Foot rounded behind, expanded and horned in front, about half the length of the shell.

24. *Chemnitzia interrupta Stimpson.* On two different occasions, half a dozen living, and two or three times as many dead specimens were dredged in four or five faths. sand. Numerous living specimens occurred in two fathoms mud on one occasion. A few other dead specimens occurred in other dredgings.. All the larger specimens had twelve or thirteen whorls, whilst Gould gives only eight or ten, probably describing from young specimens. The largest were about .35 inch in length.

25. *Scalaria clathrus Linn.* One dead specimen picked up on the beach.

26. *Scalaria lineata Say.* Two dead specimens.

27. *Cerithium Sayi Menke.* Extremely abundant. At low water mark, under stones, and in the hollow of dead shells, with *Chemnitzia trifida.* Also in mud at two faths. Great accumulations of dead shells are often found in sheltered situations, containing many of the rarer species, as *Columbella lunata*, *C. Gouldiana*, *Pleurotoma plicatum*, *P. cerinum*, *Chemnitzia producta*, *C. fusca*, *C. trifida*, *Cerithiopsis Emersonii*, *Cer. terebellum*, *Acteon punctostriata*, *Bulla canaliculata*, *&c.*, besides many specimens of *Venus gemma* and *Rissoa minuta.* The animal is greyish-black. Foot dark grey above, greyish-yellow below, narrow, rather more than one-third the length of the shell. Muzzle white. Tentacles white, with black bands. Eyes black, at outer bases of tentacles. When in confinement, the animal frequently floats with the foot upwards, like *Columbella lunata.*

28. *Cerithium nigrocinctum Adams.* Rare. Low water to ten faths.

29. *Cerithium Greenii Adams.* Rare. At low water mark on *Tubularia larynx*, attached to piles. (See *Columbella lunata.*)

30. *Cerithiopsis Emersonii Stimpson.* Moderately abundant,

four to ten faths. Animal white. Eyes near base of tentacles, prominent. Foot about quarter the length of the shell. Very active.

31. *Cerithiopsis terebellum Stimpson.* Moderately abundant. 4 to 10 faths. Very active.

32. *Cæcum pulchellum Stimpson.* Several hundred specimens were obtained from the fine sand which passed through the sieve, in examining the refuse of a dredging made several weeks before in ten faths., on a bottom of broken shells. Many of them appeared perfectly fresh, and were probably alive when dredged. I have since found it in the fine sand from almost every deep dredging; though, from its minuteness, I have never succeeding in getting it except from the dried sand, and have consequently been unable to examine the animal, so as to ascertain whether it differs from Mr. Stimpson's species, which he appears to suspect may be the case.

33. *Cæcum Cooperi* (*n. s.*). Two specimens were dredged in four or five faths. sand, in the northern part of Gardiner's Bay. The shell belongs to the section "Elephantulum" of the Genus Cœcum, as divided by Carpenter. It has about twenty-four somewhat rounded longitudinal ribs or liræ, crossed by numerous rings, rather obscure about the middle of the shell, but very distinct at the two extremities, where the longitudinal ribs become indistinct. There is a slight constriction near the mouth of the shell, which swells out again beyond it. Plug mucronate, with the apex inclining to the left, when looking at the back of the shell. The lateral profile is concave, rising rapidly towards the back. Operculum concave. Length .13 in. width in middle .035 in. The shell is white, not very thin, and moderately curved. In possessing both longitudinal ribs and rings this species resembles *Cæcum* (*Elephantulum*) *plicatum* of Carpenter, from the West Indies, which, however, is smaller, and appears, by the description, to have a much longer plug, symmetrically placed on the end of the shell. I have named the species in honor of Mr. Wm. Cooper, of Hoboken, to whose

aid I have so often been indebted in the preparation of this paper.

34. *Vermetus radicula Stimpson.* Only the tip of a single specimen occurred.

35. *Littorina rudis Gould.* Very abundant. Animal white or greyish above, head dark brownish grey, becoming bright red or purple at each pulsation. Tentacles of same color, short and blunt, bearing the eyes on bulgings at their outer bases. Muzzle large and prominent. Foot white below, about two-thirds the length of the shell, broad, rounded at both ends, grooved along the middle.

36. *Littorina littoralis Forbes & Hanley.* Not so abundant as the preceding. There appear to be at least two species included under this name, the shells of which appear to have no invariable marks of distinction, both having most of the varieties of color ascribed by Gould to the species. The animal, however, is in one whitish or yellowish, with yellow or orange head; and in the other, the head and tentacles vary from dark grey to jet black, the darkest shades being the commonest. This second variety or species is three or four times as abundant as the other. If this should not prove to be a sexual difference, which I think is hardly probable, though I have been unable to completely satisfy myself on the subject, the original name might be retained for the first species, which corresponds most nearly with Gould's description of the animal, whilst I would propose for the second the name of *L. Peconica*, from the locality in which it occurs. I subjoin more detailed descriptions.

Littorina littoralis. Animal white to light reddish yellow. Head reddish orange, becoming deeper at each pulsation. Tentacles lighter, about quarter the length of the shell, blunt, bearing the eyes on bulgings at their outer bases. Foot rounded at both ends, translucent white below, with the anterior edge opaque white; about two-thirds the length of the shell.

Littorina Peconica. Animal dark grey to black above. Head and upper surface of tentacles jet black. Tentacles about quarter the length of the shell, blunt, bearing the black eyes at their outer bases on bulgings of a lighter color. Foot half to two-thirds the length of the shell, translucent white below, with the anterior edge opaque white; rounded at both ends, and grooved below, more distinctly than the preceding. When the shell is closed, the dark upper surface, showing through the transparent operculum, gives the appearance of a yellow centre, formed by the attachment of the operculum, nearly surrounded by a wide black band; and this affords an easy method of distinguishing this species or variety from the preceding, in which, when closed, the operculum appears uniformly yellow. The shell is indistinguishable from the preceding, presenting almost all the varieties of color and marking ascribed by Gould to *L. palliata.* Found with the preceding on and under seaweed, but much more abundant.

37. *Lacuna vincta Turton.* Littoral and laminarian. Moderately abundant. The variety *fusca* is about as abundant as the striped variety, but appears to attain a larger size. The animal has a foot about two-thirds the length of the shell, rounded at both ends, not very narrow, dull white below. The white edge of the operculigerous lobe, with its lateral wings, forms a fringe around the posterior two-thirds of the foot. The tentacular filaments of the operculigerous lobe are about half as long as the tentacles. Tentacles white, long and pointed, bearing the black eyes on very short pedicels at their outer bases. Upper surface of head reddish-brown, extremity of muzzle much lighter. Upper surface of body, and operculigerous lobe, white, dotted with grey. Specimens taken in November, feeding on green algæ, had all the upper surface, except the back of the head and foot, light green, attaining a bright emerald green at the edges of the operculigerous lobe, near the operculum. The shell also, in some specimens, was distinctly green in some parts by transmitted light. The shell is generally

loaded with vegetation, sometimes of twenty times its own bulk, and I at first supposed that the color of the shell was due to a film of this, but such does not appear to be the case. [The same circumstance was noticed in some specimens of *Tectura testudinalis*, taken at the same time, in which the shell was distinctly green by transmitted light, though the animal appeared colorless.] Among specimens taken in the beginning of February from the same locality, were several which had the upper surface of the body, as well as the tentacles, dark grey to jet black. In these, as well as the light colored ones, the green tint was visible along the edges of the operculigerous lobe, as in those taken in November. Circumstances prevented any examination of the question of the correspondence of these differences with sexual distinctions. This species appears to exclusively inhabit very shallow water here, as I have never found it alive in dredging, and very rarely dead.

38. *Rissoa minuta Stimpson.* Extremely abundant dead, in some localities mixed with *Venus gemma.* Found alive, rarely, under stones at low water mark, and abundantly in mud at two fathoms.

39. *Rissoa Stimpsoni* (*n. s.* ?). Shell thin, rather dark brown. Divergence about 24°. Whorls seven, very convex, separated by a very deep suture, and distinctly wrinkled by the lines of growth. Apex obtuse. Aperture oval, nearly one-third the length of the shell. Length ·23 in., of which the first whorl occupies rather more than one half. Only two specimens were found. Mr. Stimpson thinks it new, but suggests that it may possibly be a giant form of *R. minuta*, which it resembles in form, though darker colored and much larger.

40. *Skenea* (*n. s.* ?). About $\frac{1}{15}$ of an inch long. Mr. Stimpson thinks it new. Only one specimen was found, which is in a state that will hardly admit of a satisfactory description.

41. *Calyptrea striata Say.* Only one dead specimen was picked up on one of the beaches in Gardiner's Bay. About Montauk Point a number of specimens were found, though it

appears to be a rare shell. One specimen obtained here much exceeded the dimensions stated by De Kay, having a length of 1·35 and breadth of 1·2 inches, with a height of 0·43 in. The shell, as found here, is much less elevated than De Kay's description gives an idea of, though, as the figure does not appear to correspond, there may perhaps be a typographical error in the height given. The figure, however, represents a more elevated shell than any specimens I have found here. Specimens from Eastport, Maine, have about the same proportions as ours. As suggested by Mr. Stimpson, in his "Invertebrata of Grand Manan," this may probably form a new species.

42. *Crepidula fornicata Lamarck.* The most abundant shell of the bays, occurring in multitudes at every depth, and on almost every bottom from low water mark to ten fathoms, and even on a bottom of dead shells, where hardly anything else is found alive. The animal varies very much in color. The lower surface of the head, and both surfaces of the foot, are generally, in adults, yellowish white to light reddish yellow, the head being lightest. Sometimes, however, they are covered with a grey or black pigment, and in this case the tentacles are generally grey or black also. These differences do not appear to depend upon sex, as the black horn-shaped male genital organ, on the right side of the head, is found in some individuals of all tints. (In one black individual, this organ was white.) Neither does it appear to depend on age, though the young are generally dark colored. The shells of both varieties are exactly alike, and both generally occur in almost every group that may be picked up. Upper side of the head black. Tentacles thick and blunt, bearing the eyes on bulgings at their outer bases. Muzzle tipped with opaque white, deeply cleft. Mantle black, with a wide border of translucent white or yellowish, mottled with opaque white. Gill very large, nearly white, but appearing grey from the black mantle beneath. Anus white, on right side, near front of the foot. The horn-shaped male organ is about as long as the tentacles.

The foot has an appendage in front, slightly horned, which can be extended as far as the base of the tentacles.

43. *Crepidula convexa Say.* Abundant. Low water to 10 fathoms. Animal dark grey, except the tentacles and end of muzzle, which are white.

44. *Crepidula unguiformis Lamarck.* Abundant. Low water to 10 faths. Grows to the length of $1\frac{7}{16}$ inches, and is frequently very rough-looking, appearing like small oysters. Specimens from the upper side of large stones are extremely thin and smooth. The animal is white.

45. *Tectura testudinalis Gray.* Moderately abundant. Low water. The animal is white. Foot regularly elliptical. Tentacles very long and slender, nearly two-thirds the length of the shell. Eyes sessile at outer bases of tentacles, and a little beneath them. Gill white, about one-fifth the length of the shell. Head rounded, showing the brown horny jaw in the centre. The fringed margin of the mantle extends beyond the shell all round. The shell does not attain a large size here, the longest having a length of seven-tenths of an inch, and few exceeding half an inch.

46. *Chiton apiculatus Say.* Moderately abundant. Four to ten fathoms.

Pulmonifera.

47. *Melampus corneus Stimpson.* Very abundant.

Tectibranchiata.

48. *Acteon punctostriata Stimpson.* Rare. Dead specimens occur amongst the accumulations of *Cerithium Sayi*, and *Venus gemma.*

49. *Bulla solitaria Say.* Rare. In mud at two fathoms, with *Rissoa minuta*, and *Venus gemma.* Animal light greyish, spotted with light grey.

50. *Bulla canaliculata Gould.* Not so rare as preceding

species. Alive in two fathoms mud. A good many specimens obtained from accumulations of *C. Sayi*, etc.

Nudibranchiata.

51. *Æolis vermiferus* (*n. s.*). One specimen was found at low water mark, on the 17th of November. It was half an inch long. Back greyish white, thickly spotted with greenish grey, with a deep orange colored spot between the oral tentacles, a second long and narrow one, wider in the middle, extending from the dorsal tentacles to the first clusters of papillæ, and a third between the first and second clusters, having the form of an isosceles triangle with hollowed sides, whose base line, of a deeper orange, was on the median line of the back, and the apex was situated on the side, half way between the upper and lower surfaces. Under the tentacles, on the left side, another orange line existed. The anterior half of the lower surface was white, the posterior half light salmon color, showing through the foot. Foot long, narrow, white, nearly transparent, pointed behind, and horned in front. Tentacles four, the oral the longest. Eight clusters of papillæ, with four or five in each cluster, transparent white, filled with dark grey, apparently fœcal matter; very irregular in diameter and length. The name I propose alludes to the worm-like appearance of these bunches of grey papillæ.

Lamellibranchiata.

52. *Ostrea borealis Lamarck.* I have been assured by the fishermen that the oyster is indigenous to some parts of the Bays, but I have only once found it under such circumstances as to render it probable that the specimens were not introduced ones. In the eastern part of Peconic Bay I found an extensive bed of dead shells of very large size, perforated throughout by boring sponges.

53. *Anomia ephippium Linn.* and varieties *electrica* and *squamula.* Extremely abundant. Low water to ten fathoms.

54. *Anomia aculeata Gmelin.* A number of specimens were obtained from the roots of large seaweeds, brought up by stones, together with *Saxicava distorta*, and *Mytilus edulis.*

55. *Pecten irradians Lamarck.* Extremely abundant. In winter I have seen ridges a foot high, of the living shells, driven up by a storm, lining the shore for long distances. The finely-colored and rayed varieties are also extremely abundant. Low water to three or four fathoms.

56. *Mytilus decussatus Mont.*=*Modiola glandula.* A few dead specimens were dredged in Gardiner's Bay.

57. *Mytilus corrugatus Stimpson*=*Modiola discors Gould non Angl. fide Stimpson.* One living specimen dredged in about five fathoms mud.

58. *Mytilus lævigatus Stimpson*=*Modiola discrepans Gould.* One fresh valve found with the preceding.

59. *Mytilus edulis Linn.* Not abundant. Littoral.

60. *Mytilus modiolus Linn.* Abundant — to ten fathoms.

61. *Mytilus plicatulus Deshayes.* Abundant. Littoral.

62. *Arca transversa Say.* Abundant. Three to ten faths.

63. *Arca pexata Say.* Rare.

64. *Nucula proxima Say.* Abundant. Two to ten faths.

65. *Leda limatula Stimpson.* Rare. Two to five faths. mud.

66. *Leda sapotilla Stimpson.* Rare and small. Three faths. mud.

67. *Solemya velum Say.* Rare. Two to ten faths. mud and sand. Once, in winter, when the ice which had fringed the shore disappeared, a very great number of unusually large ones, containing the animal, were found floating at the water's edge on a mud-flat where only one or two fathoms water existed for a long distance out, and where I have only once succeeded in dredging a few very small ones. The animal is extremely active.

68. *Solemya borealis Totten.* A fragment of a Solemya,

much longer than the preceding species, blackish brown outside, and lead color inside, I refer, with some doubt, to this species.

69. *Cardita borealis Conrad.* A few very small dead specimens were dredged, at different times, in Gardiner's Bay.

70. *Cardium Mortoni Conrad.* Extremely abundant in the mouths of creeks and on shallow flats, from low water mark to two faths. The markings are finer and more varied than I have ever seen in specimens from other localities, some specimens being entirely of a dark fawn color, whilst others are completely white. The zigzag markings frequently occur in great perfection, even on specimens of the largest size. Specimens sometimes occur entirely devoid of the internal purple blotch, which Dr. Gould states to be the only invariable mark of distinction from *Card. lævigatum* of the West Indies. The species is most abundant and finest in a long narrow bay on Shelter Island, which divides the two bays, now called Cocle's Harbor, but which, on an old map of Long Island, I find called Cockle Harbor, probably from the abundance of this shell. The animal is white and has short conical siphons, each marked with a circle of brown spots. The foot can be extended to three times the length of the shell. The siphonal extremity is fringed with numerous cirri, which extend a good deal beyond the shell.

71. *Cardium pinnulatum Conrad.* Several dead pairs and single valves (very fresh) were dredged on two occasions in Gardiner's Bay, and a single very small dead pair in Peconic Bay.

72. *Astarte mactracea Linsley.* Dead pairs and single valves are abundant in every dredging from five to ten faths. but I have never obtained it alive.

73. *Venus mercenaria Linn.* Moderately abundant.

74. *Venus gemma Totten.* Very abundant. (See remarks on *Rissoa minuta* and *Cerithium Sayi.*) Alive in two faths. mud, with *Cer. Sayi*, *Nassa obsoleta*, *Mactra lateralis*, and great

numbers of *Rissoa minuta*, and compound Ascidians in a large salt-water pond, communicating with the bay only during storms.

75. *Cytherea convexa Say.* One dead valve was dredged in Gardiner's Bay. On the south side of Montauk Pt., dead valves are not uncommon.

76. *Petricola dactylus Say.* Rather rare.

77. *Petricola pholadiformis Lamarck.* Much rarer than the preceding.

78. *Mactra lateralis Say.* Rare. Two faths. mud. Five or six faths. sand.

79. *Mactra solidissima Chemnitz.* Alive, rarely, in sand at ten faths. but not more than two inches long. Dead valves are not uncommon in deep water, but I have never found them more than three inches long; whilst around Montauk Pt. I have obtained it seven inches long.

80. *Kellia planulata Stimpson.* Rare. A few specimens were found alive at low water mark in mud, and a few dredged in four to six faths. mud.

81. *Montacuta elevata Stimpson.* Only one valve found.

82. *Tellina tenera Say.* Moderately abundant. Two to eight fathoms generally in sand, though sometimes in mud. When placed on the surface of sand in a basin of salt-water, it soon extends its foot, and by a single effort jerks itself upright, and then, with two or sometimes three strokes, completely buries itself.

83. *Tellina tenta Say.* Less abundant than the preceding species. In sand at six faths., and mud at two faths.

84. *Tellina fusca Phil.* Abundant dead, and rare alive in mud near low water mark in a large shallow salt water pond, communicating freely with the Bay. The specimens were white, yellow, pink and bluish in about equal proportions, were very thin, and averaged three quarters of an inch in diameter. Also dredged, rarely, in sand at six faths., very small and light pink.

85. *Cumingia tellinoides Conrad.* Single valves are very abundant in every dredging on sandy or shelly ground, from ten fathoms up to five, but I have only twice found it containing the animal. One of these was in mud, at low water mark (in the same pond as *Tellina fusca*), and was much thicker and shorter than any others I have seen; but Mr. Wm. Cooper is of opinion that it is merely a distorted specimen, perhaps from the influx of fresh water.

86. *Solen ensis Linn.* Not very abundant.

87. *Solecurtus bidens Forbes & Hanley.* One or two dead specimens.

88. *Mya arenaria Linn.* Extremely abundant.

89. *Corbula contracta Say.* Tolerably abundant dead (frequently with the valves united), at every depth from ten faths. up, but I have never obtained a living specimen.

90. *Anatina papyracea Say.* Dredged, very rarely, in three to five faths. muddy sand, in Gardiner's Bay.

91. *Cochlodesma Leanum Couthouy.* A few specimens were dredged in three fathoms sand, and dead valves occasionally occur at all depths. After a violent easterly gale, a large number of fine specimens, containing the animal, were picked up on the eastern side of Napeague Pt., together with numerous specimens of *Pandora trilineata*, *Petricola dactylus*, *P. pholadiformis*, &c.

92. *Lyonsia hyalina Conrad.* Dredged, rarely, from six faths. upwards, generally in sand. Once, after a violent storm, very numerous and fine specimens were driven up on a beach facing an extensive mud flat; and on another beach, also facing a large mud flat, a few specimens, containing the animal, occur after almost every south-east storm.

93. *Thracia Conradi Couthouy.* A single valve, doubtfully referred to this species by Mr. Wm. Cooper, was dredged in ten fathoms.

94. *Pandora trilineata Say.* Rather rare in the Bays. Dredged in from two to six faths. Great numbers, containing

the animal, were thrown up on Napeague Pt. after an easterly gale. (See *Coch. Leanum.*)

95. *Saxicava distorta Say.* A few specimens are occasionally thrown up on the beach, attached to the roots of fuci.

96. *Teredo* (*probably dilatata Stimpson*). Rare; in piles from a pier.

Tunicata.

Both the simple and compound Ascidians are very numerous. I have prepared descriptions of a large number of species, most of which, so far as I can ascertain, are undescribed, at least from the American side of the Atlantic; but as I have not yet been able to fully satisfy myself as to those which are identical with described species, I think it safer, for the present, to defer describing or naming those which I suppose to be new. The genera noticed are Ascidium, Molgula, Cynthia, Botryllus, Botrylloides? Didemnium, Aplydium, and Amorœcium or its subgenus Parascidium; and the number of species is at least eighteen or nineteen, and I am disposed to think, much greater.

(Note.) The remarks as to size, depth at which dredged, &c., annexed to each species in this paper, refer, unless otherwise stated, only to the species as occurring within the strict limits of the two bays named. Remarks as to size, &c., in the neighboring waters, are, in a number of instances, added.

The extreme depth of water in Peconic Bay is ten or eleven fathoms. Gardiner's Bay is a good deal shallower, there being few places where more than five fathoms can be found.

For determinations of most of the species about which I have felt any doubt, as well as for much other assistance, I am indebted to Mr. Wm. Cooper of Hoboken, and to Mr. Stimpson of Washington.

I have adopted, without exception, the names of Mr. Stimpson's "Synonymy of the Shells of New England," not having had sufficient opportunity to acquaint myself with the more recent changes in nomenclature.

I subjoin a table giving the formations in which the shells occur as fossils, as well as the Geographical Range of the living shell. In this I have included all the other shells which are found from Stonington to Cape Cod; so as to comprise in it all the species of the extreme north of the Atlantic Molluscan Province. This table is of course very far from being complete, but may serve to give an idea of the Geographical and Geological relations of the Fauna. The principal authorities employed have been "Forbes on the Geological Relations of the Existing Fauna and Flora of the British Isles," Mr. McAndrew's reports on dredging, Dawson & Lyell's papers on the Canadian Glacial beds, Mr. Bell's catalogue of the shells of Canada, Stimpson's "Shells of New England," Lyell's papers on American Miocene deposits, Tuomey & Holmes' Post Pliocene Fossils of South Carolina, Tuomey's Geological Report on South Carolina, Mr. Kurtz's list of the shells of North and South Carolina, and many of Conrad's papers in Silliman's Journal, and the Journal of the Academy of Natural Sciences of Philadelphia.

Eleven species occur in the Post Pliocene of Florida, all except one of which are already known to exist as far south, or may probably be found there hereafter. *Mytilus edulis* is marked by Conrad as fossil from St. John's River, Fl., but does not occur in Kurtz's list of N. Carolina and S. Carolina shells.

Thirty-nine species occur in the Post Pliocene of South Carolina, three of which, *Leda limatula*, *Thracia truncata*, and *Natica heros*, I can find no mention of as recent shells so far south, whilst *Cardium Mortoni*, though said by Conrad to be abundant in Florida, does not occur in Kurtz's N. C. and S. C. lists, and is considered by Tuomey & Holmes as probably fossil only in South Carolina.

Vermetus radicula is fossil in North Carolina, and recent in Florida, and *Cytherea convexa* is fossil in N. Carolina, and though occurring in Kurtz's recent list, is marked there as very probably fossil only.

In the Glacial Beds of Canada seventeen species occur, in-

*Lol
*Ra
*Py
*Py
*Bu
*Bu
*N
*N
Na
*Pu
Trit

cluding two doubtful identifications, all of which have been, or are likely to be found, in the Canadian waters.

In the Glacial beds of Northern Europe twenty-five species occur, including five doubtful identifications, all of which, except *Buccinum plicosum*, *Leda tenuisulcata* (both of which are doubtful identifications), and *Aphrodite Groenlandica* are now living there.

In the Pliocene of South Carolina occur thirty-one species, all of which, except *Natica heros*, *Leda limatula*, and *Cytherea convexa*, are now living there.

In the English Red Crag occur eight species, including two doubtful identifications, of which only *Leda tenuisulcata* (doubtfully identified) and *Aphrodite Groenlandica* are not now inhabitants of Europe. In the Miocene of N. Carolina, Virginia, and Maryland, fifteen species occur, all of which, except *Natica heros*, *Pecten Magellanicus*, *Mytilus decussatus*, and *Mytilus modiolus*, are now living on these coasts, and some of the exceptions are probably only due to the imperfect lists at my command.

In the English Coralline Crag seven species occur, including one doubtful identification, all of which are living European species.

Forty-nine species are apparently at or near the northern extremity of their range; thirty-two at or near the southern extremity of it. Seventeen extend from S. Carolina or Florida to the Gulf of St. Lawrence or farther north, passing through the entire length of the Atlantic and Boreal Provinces into the Arctic Province. Twenty-five range along the whole coast of New England, or for a short distance only on each side of Cape Cod, so that Greenport may be considered as not far from the middle point of their range. Six are found only at one locality, or range only between New York and Cape Cod. Twenty-four are found living in Europe, including one or two doubtful identifications.

Note.—Mr. P. P. Carpenter having seen the specimens of *Cæcum Cooperi*, since the description of it was in type, is of opinion that it is an already described Southern species, probably his *C. imbricatum*, but being unable at the moment to compare specimens or descriptions could not pronounce positively.

XXI.—*Review of the American* Bombidæ, *together with a Description of several Species heretofore undescribed, being a Synopsis of the species of this family of Hymenopterous Insects thus far known to inhabit North America.*

By John W. Greene, M.D.

Read April 23d, 1860.

Saint Fargeau adopting, with certain modifications, Latreille's classification of the Hymenoptera, according to the habits of the families comprising the order, has placed the Bombidæ under the group of Annual Societies, or those which live in companies but for one season, perishing to be replaced by their offspring the succeeding year. Their characters, as laid down by him, are as follows:—

Tongue almost cylindrical; in repose about the length of the head; as long as body when in action.

Males, females, workers, all having wings in the perfect state.

Antennæ vibratile, filiform, second article shorter than the third, almost globulous, the third a little conical.

Posterior legs having two spines at their extremities.

First article of the posterior tarsi dilated at the external angle of the base, in form of a pointed ear.

Radial elongated, internal, and detached from the side or external nerve of the wing.

Four cubitals, the first almost entirely divided in two by a nervure, which descends to the side, the second a little contracted towards the radial, receiving the first recurrent nervure, the third drawn up more than half towards the radial, receiving the second recurrent nervure near the fourth cubital, this one not being commenced; the cells of the limb confounded with the fourth cubital.

The three discoidal cells complete. Ocelli disposed in right line. Body velvety.

1st (and only) Genus Bombus, Fab. Latr.
Bremus, Jur.
Apis, Linn.

The characters of the unrestricted genus are all contained in those of the family as already given.

SYNOPSIS OF SPECIES.

With St. Fargeau we divide the genus into three sections, based on the colors of the hairs on the last segments of the abdomen.

* *Last segment of the abdomen yellow or red.*

Two species of this section have, we believe, been identified, and perhaps three; the *B. occidentalis*, when described, we placed in the next section, as, although the terminal segments have a yellowish tinge, we have been in doubt whether this may not have been caused by alcoholic immersion.

1. Bombus Suckleyi, Greene. * (4)

Head black, on vertex a few yellowish hairs. Corselet, anterior part covered with yellowish hairs which extend around, under, and are spread upon the sides of the thorax. A bare roundish black space between wings, posterior part yellowish.

Tergum yellowish but covered by scattered hairs, the fifth, sixth segments, and anus more deeply covered than the other segments; the middles of these segments are slightly blackish.

Length ¾ of an inch ♀. In my cabinet.

Habitat.—Puget's Sound. Dr. Suckley!

2. Bombus Carriei, Greene. * (5)

Head yellowish. Corselet, sides, and anterior part, covered with greyish yellow hairs. Centre black, posterior greyish yellow.

Tergum—first and second segments greyish yellow; third segment black; fourth, fifth, and sixth segments and anus reddish.

Length ⅝ of an inch ♀. In my cabinet.

Habitat.—Fort Steilacoom, Wash. Ter. Dr. Suckley.

** *Last segment of abdomen white.*

But one species of this division has hitherto been identified in North America, and that is from the Pacific coast.

3. Bombus occidentalis, Greene. (2)

Ann. Lyceum Nat. Hist. N. Y. Dec. 1858, Vol. VII.

Face between eyes yellowish, white anteriorly and laterally; first four abdominal segments black; the rest, including anus, white; length about nine lines, ♀.

Habitat.—North-west Coast of America, Fort Vancouver, Dr. Cooper; Puget's Sound, Dr. Suckley.

In my cabinet.

*** *Last segment black.*

Ten species are known to entomologists as found in North America; from which it appears that this is the prevailing type of coloration.

4. Bombus Virginicus, Fab.

Piez. 14, Drury Ins. t. I. tab. 43, fig. I.

Black, above and sides of corselet of a greyish yellow, first segment of the abdomen the same; some greyish yellow hairs upon the vertex of head; hairs under the first article of tarsus reddish. Wings a little smoky, mostly so at the ends, where they are a little violaceous.

Length 13 lines, ♀. In my cabinet.

Habitat.—Western America.

5. Bombus fervidus, Fab. Piez. 48.

Bombus *actif St. Farg.* Hist. Nat. Hymenop. p. 470, Vol. I. Paris, 1836.

Head black. Sides of the corselet and back of a dirty yellow; between the wings a narrow black band, underneath the corselet black. The shield and four first segments of the abdomen of a dirty yellow (perhaps *yellow* in the living), the fifth and the anus black; feet black; wings smoky, violaceous.

Length 13 lines. ♀ In my cabinet.

Habitat.—Pennsylvania.

6. Bombus sonorus, Say.

Say's Entom. Le Conte, p. 787, Vol. II. New York, 1860. Baillière Bro.

Body yellow, head black, thorax with a broad black band in the middle; wings violaceous black; tergum with the first, second, and third segments yellow, the others black, beneath black.

Length four-fifths of an inch ♀.

Habitat.—Mexico.

7. Bombus ephippiatus, Say.

Say's Entom. Le Conte, p. 788, Vol. II. N. Y. 1860. Baillière Bro.

Body black; pleura pale yellow; wings dusky, tinged with violaceous; tergum pale yellow towards the base, this color being gradually narrowed behind and terminating on the third segment, forming somewhat of a semioval, with its base to the thorax, and confluent with the color of the pleura.

Length less than half an inch.

Habitat.—Mexico.

8. Bombus ternarius, Say.

Say's Entom. Le Conte, p. 788, Vol. II. N. Y. 1860. Baillière Bro.

Head black; thorax with dull yellowish hair and a blackish band in the middle; wings with a slightly yellowish tinge; nervures fuscous; tergum fulvous on the second and third segments, first and fourth segments yellowish, rest black.

Length three-fifths of an inch ♂.

Habitat.—Indiana.

9. Bombus Americanorum, Fab. Piez. No. 16.

Bombus *Americain St. Farg.* Hist. Nat. Hymenop. Vol. I. p. 472.

Black, a large yellow band upon the front of the corselet. Abdomen yellow above the base of the first, fourth, and fifth segments, and the anus black. Legs and tarsi shaded with blackish red, their hairs above black, below red; wings brownish with a violet reflection.

Length 10 lines ♀.

Habitat.—Western America.

10. Bombus Huntii, Greene. * (3)

Head black and bare except in middle, which has a line of yellow hairs extending from the mouth to the vertex. Corselet, anterior third covered with yellow hairs that extend quite to sternum, a transverse black stripe covers the middle, having its centre bare and shining, the posterior third yellow. First segment of abdomen black, having on each side a large tuft of yellow; the second and third segments bright red, the fourth yellow with greenish tinge; last segment and anus black. Thighs, legs, and tarsi black, inclining to reddish. Wings smoky. Length about twelve lines. Female.

Habitat.—Utah Territory.

This specimen was furnished me by Dr. Suckley, who obtained it from Major Franklin E. Hunt, Paymaster U. S. Army, to whose friendly interest in science I am indebted for many valuable specimens of Hymenoptera, and in whose honor I have named this beautiful species.

It approaches nearly to *B. rubriventris;* it differs in having the first and fourth segments yellow, the first of *B. rubriventris* being black, and the fourth red.

The colors indicated in my description are those of the hairs which cover the parts designated. The color of the integument in this family is generally black; when this is not the case it will be stated.

11. Bombus interruptus, Greene.

Ann. Lyceum Nat. Hist. Vol. VII. Dec. 1858.

Muzzle yellowish; black between eyes. Corselet yellow, black spot between wings; first, second segments and anus black; the third, fourth, and fifth segments black fringed with yellow hairs on the lower margin of the segments on each side; middle of tergum black, smooth, and shining; legs reddish black; wings smoky.

Size nearly that of *B. Virginicus.*

Habitat.—N. W. Coast of America, Wash. Territ., Oregon, Dr. Suckley.

In my cabinet.

12. Bombus Carolinus. Auct. (St. Fargeau.)

Head black, thorax black, first and fifth segments and anus black, second, third, and fourth red; legs and tarsi shaded reddish black; wings brownish with a violet reflection.

Length 11 lines ♀.

Habitat.—Carolina.

I know of no specimen of this species, but its existence is indicated, and diagnostic characters given, by St. Fargeau. See his work, Vol. I. p. 472, *et seq.*

13. Bombus violaceus, St. Farg.

Hist. Nat. Hymenop. p. 473, Vol. I.

Black, feet black; hairs below the legs and tarsi red; wings brownish with a violet reflection.

Length 13 lines ♀. Worker alike. Length 6 lines.

Habitat.—Western America.

NAME.	SECT.	HEAD.	THORAX.	1st SEG.	2d SEG.	3d SEG.	4th SEG.	5th SEG.	6th SEG.	ANUS.
B. occidentalis,	2nd.	Yellowish		Black	Black	Black	Black	White	White	White
Virginicus, .	3rd.	Black and Yellow	Grey Yellow	Grey Yellow	Black	Black	Black	Black	Black	Black
Huntii, . .	3rd.	Black and bare, middle Yellow	Yellow Black Yellow	Black Yellow	Red	Red	Yellow	Black		Black
fervidus, .	3rd.	Black	Black Yellow	Yellow	Yellow	Yellow	Yellow	Black		Black
interruptus,	3rd.	Black Yellow	Yellow	Black	Black	Black Yellow	Black Yellow	Black Yellow		Black
sonorus, . .	3rd.	Black	Broad bl'k, band in middle.	Yellow	Yellow	Yellow	Black	Black	Black	Black
ephippiatus,	3rd.	Black	Yellowish	Yellow	Yellow	Yellow Black	Black	Black	Black	Black
ternarius, .	3rd.	Black	Yellowish	Yello'ish	Fulvous	Fulvous	Yellow	Black	Black	Black
Americanorum,	3rd.	Black	Yellow band	Yellow	Yellow	Yellow	Yellow Black	Yellow Black		Yellow and Black
Carolinus, .	3rd.	Black	Black	Black	Red	Red	Red	Black		Black
violaceus, .	3rd.	Black	Black	Black	Black	Black	Black	Black		Black
Suckleyi, .	1st.	Black	Yellow Black	Yellow	Yellow	Yellow	Yellow	Yellow Black	Yellow Black	Yellow
Carriei, . .	1st.	Yellowish	Greyish Yellow Black	Greyish Yellow	Grey Yellow	Black	Reddish	Reddish	Reddish	Reddish

Note.—Since the foregoing paper went to press, I find that the following species of Bombi have been mentioned as from N. America. I regret that the short time allowed me before the printing of this monograph will prevent, for the present, anything more than the simple enumeration of their names.

Bombus elatus, Fab. Syst. Piez, 352, N. A.
“ laboriosus, “ “ “ 352, Car.
“ Marylandicus, “ “ “ 346, N. A.
“ Arcticus, Kirby, Parry's 1st Voy. App. 470.
“ Borealis, “ Faun. Boreal. Am. 272, Arct. Am.
“ praticola, “ “ “ “ 274.
“ sylvicola, “ “ “ “ 272.
“ terricola, “ “ “ “ 272.
“ Californicus, Smith, Brit. Mus. Cat. II. 400, Calif.
“ frigidus, “ “ “ “ II. 399, Huds. Bay.
“ ornatus, “ “ “ “ II. 398, Huds. Bay.
“ Kirbiellus, Curtis, Ross, 2d Voy. App. Arct. Am.

The following are doubtful:—

Bombus nidulans, an *Anthophora?* see Fab. Piez, 349, N. A.
“ Virginicus, Fab. Piez, p. 349, is Apis Virginicus.
“ derhamellus, Kirby, Faun. Bor. A. 273, N. A.
Doubtful. This is an European variety.

For this list I am indebted to Mr. E. Norton.

XXII.—*Notes on North American* Crustacea, *in the Museum of the Smithsonian Institution. No. II.*

By William Stimpson, M.D., Corresponding Member.

Read April 16th, 1860.

In this second part of our contributions to North American Carcinology we had intended to treat of the Macrurous Crustacea, having published, in the first part, the notes then in our possession upon the Brachyura and Anomura; but our knowledge of the development of these two sub-orders upon this continent has been so greatly increased by recent investigations, that it is found necessary to review them in this second part, in order to include the results. As will be seen below, these rich materials have been chiefly accumulated by Mr. John Xantus, in the course of his most successful researches into the fauna of Cape St. Lucas, at the southern extremity of the peninsula of Lower California. We have also added a number of interesting species collected in the West Indies by Mr. A. H. Riise of St. Thomas.

The type-specimens of all the species herein described are in the Museum of the Smithsonian Institution.

MAIOIDEA.

Pelia mutica.

Pisa mutica Gibbes; Proc. Am. Assoc. 1850, p. 171.

This species belongs to *Pelia* of Bell, an American genus, species of which are found on both sides of the continent. It differs widely from *Pisa* in the want of a præorbital spine, in the long narrow basal joint of the external antennæ seen from above along the side of the rostrum, and in the compressed feet with unarmed terminal joints.

It was found in Charleston Harbor by Prof. Gibbes and myself. It has also occurred to me in Beaufort Harbor, N. C., and in Holmes' Hole, Martha's Vineyard. It most commonly occurs among ascidians on the piles of wharves, below low tide mark.

Thoe sulcata, nov. sp.

Allied to *T. erosa* Bell, Trans. Zool. Soc. of London, ii. 48, pl. ix. f. 4,—a Gallapagos species. But the carapax is generally more triangular, with the sides and subhepatic regions granulated. Rostrum less deeply bifid. Frontal region with two longitudinal rows of sharp tubercles, three in each row. The basal joint of the external antennæ is exposed from above, and separated from the fronto-orbitar region by a deep suture or pit, and there is also a deep pit on the spine of its exterior angle, which spine is beneath separated from the rest of the joint by a deep groove continuous with the superior pitted suture; beneath, also, the basal joint is channelled along its external margin, where it forms the lower floor of the orbit. The moveable part of the external antennæ is shorter and broader than in *T. erosa*, and ciliated on both sides; the third and fourth joints are broad and pitted, the fifth and terminal ones very slender. The meros-joint of the endognath in the external maxillipeds, is more prominent and less rounded at its external angle. In the chelipeds the tips of the fingers are excavated, and the tooth of the dactylus is not bifurcated. Meros of ambulatory feet deeply bi-sulcated longitudinally, and armed with a series of short strong spines along the superior margin.

Length nine-tenths of an inch.

Found at Cape St. Lucas, Lower California, by John Xantus, Esq., tidal observer for the U. S. Coast Survey.

It is difficult to decide, without comparison of specimens, whether this species be identical with *T. erosa* or not. We have named it because we consider it far better for the interest of science to admit a slight risk of adding a synonym, than to refer a species to a locality at which it does not exist, which would tend to confuse our ideas upon geographical distribution, a knowledge of which constitutes one of the most important aims in our investigation of species.

Thoe puella, nov. sp.

Carapax as in *T. erosa* protuberant, but broader at the eyes, and with the antero-lateral sides straight or even a little concave. Two protuberances on the intestinal region, and two longitudinal ridges on the frontal. Rostrum acute, deeply fissured. In the chelipeds there are no excavations on the superior side of the meros, but this joint, with the carpus and base of the hand, is granulated; hand elsewhere smooth and polished, with the fingers less gaping than in *T. erosa*, and the dactylus one-toothed within. Ambulatory feet depressed, angular or dentated; meros in the first three pairs longitudinally ridged and greatly dilated posteriorly, the dilated portion with two deep concavities, sometimes confluent; penult joint unidentate on the superior margin. Color bright red, with yellow patches on the carapax.

Length of the carapax 0·32; breadth 0·27 inch.

Found at the Tortugas Is., Florida, by Dr. Whitehurst.

Hyas araneus.

Hyas araneus Leach, Mal. Pod. Brit., pl. 21, A.

We are enabled to announce this species as an inhabitant of our coast, having dredged several specimens off the coast of Maine on a cruise in the summer of 1858.

Milnia, nov. gen.

We propose this name for a section of *Pericera* with less completely tubular orbits, the species of which have been placed in *Pisa* by some authors. The type is *Pisa bicornuta* Latr. (*Pericera bicorna* M. Edw.) It is very different in aspect from those sharply triangular forms, with the moveable part of the antenna slender and concealed, which constitute the true *Pericerœ*, and approaches *Pisa* and *Tiarinia* in shape. The horns of the rostrum are divergent, and the moveable part of the antenna is exposed from above, as well as the spiniform process of its basal joint. From *Pisa* it differs in its orbits, which are nearly as tubular as in *Tiarinia*, from which latter genus this differs in the divergence of the rostral horns. *Pisa styx* and *P. aculeata* will be here included.

Milnia bicornuta.

Pisa bicornuta Latr.
Pericera bicorna M. Edw.; Hist. Nat. des Crust. i. 337.
Pisa bicorna Gibbes.
Pericera bicornis Sauss, Crust. nouv. de la Mexique, etc. p. 12, pl. i. f. 3.

We do not know why M. Edwards changed Latreille's name *bicornuta* to *bicorna*. The latter is probably a misprint for *bicornis*, but has been in common use since the publication of Milne Edwards' work.

This is a common West Indian species, and has been received in abundance from the coral-reefs of Florida, from all who have made collections there for the Smithsonian Institution.

Milnia platysoma, nov. sp.

Allied to *Pisa aculeata* Bell, but presents the following differences. Carapax depressed, but of less breadth, and sparsely granulated. There are only two laminiform processes on the antero-lateral margin,—one on the hepatic region, and the other on the branchial, which latter does not project in an imbricated mannner. Between these processes and below their level there is a spine. There are only two spines on the branchial region, and these are scarcely more than sharp tubercles. There is a row of bead-like tubercles on the superior edge of the posterior margin. The rostrum is more flattened than in *M. aculeata*, the orbits more tubular, and the præorbital teeth sharper. The basal joint of the external antennæ is very broad, and is armed with two teeth or spines on the surface near the postero-exterior angle. The feet are short and depressed, and armed with spines as in *aculeata;* penult joint with a broad, rounded, lamelliform process for the articulation of the dactylus, which is very much curved and sharp. The posterior feet are broadest.

Length of the carapax, 0.44; breadth, 0.33 inch.

Found at Cape St. Lucas, by Mr. Xantus.

Pericera laevigata, nov. sp.

Carapax elongated, convex; surface pubescent and partly hairy, hair crispate; back and sides smoothly rounded, with no spines or tubercles except a minute one on the intestinal region. Orbital tubes rather large; post-orbital teeth more prominent than the praeorbital, the distance between their tips equalling five-sixths of the greatest breadth of the carapax. The rostrum forms between a fourth and a fifth of the length of the carapax; it is deflexed, curving downward, bifid, with the horns united at base for one-third their length, then divergent. The moveable part of the external antennæ is longer than the rostrum; the spine of the basal joint is large, prominent, exposed from above, divergent from the rostrum, and much nearer to the orbital tubes. In the chelipeds, the meros-joint is armed above with obtuse spines; the hands are rather compressed, crimson in color; fingers with the distal half black, except the tips, which are white.

Length of the carapax in the male, 0.88; greatest breadth (posteriorly) 0.49 inch.

Inhabits St. Thomas, West Indies. A. H. Riise.

Pericera fossata, nov. sp.

Surface everywhere covered with a uniform short, dense, closely-adhering pubescence. A few curled setæ on the rostrum, and on the concave antero-lateral slopes of the carapax. Lateral processes long, blunt, and a little curved forward. The regions of the carapax are protuberant and separated by very deep sinuous pits or channels, appearing somewhat as if eaten out; but the protuberances themselves are not vermiculated. The rostrum is as long as the distance between the eyes; —the horns diverge, the distance between their tips equalling about two-thirds that between the orbits. The spine of the basal joint of the antennæ is slender, and reaches considerably beyond the præorbital tooth. The abdomen in the female shows a deep, vermiculated furrow on each side of the median rounded ridge;—also channelled sutures. Color dark buff, inclining to brownish. Length of the carapax in the female, 1.32; breadth, 1.20 inch.

It resembles *P. trispinosa* in form. It differs from *P. villosa* Bell, in the concave outline of its antero-lateral margin, the character of the dorsal surface, and the less divergent horns of the rostrum.

Cape St. Lucas. J. Xantus.

Pericera subparallela, nov. sp.

Body covered with short tough pubescence. Carapax triangular, shaped somewhat as in *P. trispinosa*, but much narrower, and with the antero-lateral sides not concave. Lateral spines or processes subtriangular, but sharp, and connected with each other by a nearly straight row of short spines or sharp tubercles crossing the back. A tubercle on the posterior part of the gastric, and one on the intestinal region; both very small. The rostrum forms one-fourth of the length of the carapax, with the horns nearly parallel, being scarcely farther apart at their extremities than at the base, where they are connected for one-third their length by a web-like expansion of the front. The distance between the tips of the horns of the rostrum equals three-fifths that between the tips of the præorbital spines; the upper sides of these horns are clothed with curled hairs or crispate setæ, which extend posteriorly in the same longitudinal lines as far as the branchial regions, and also clothe the sides of these and the hepatic regions. The median concavity of the front between these two lines—continuous on the gastric region—is destitute of crispate setæ. The moveable part of the external antennæ is concealed beneath the rostrum; the anterior spine of the basal joint is small and slender, but exposed from above. Orbital tubes prominent. Chelipeds in the male a little shorter than the carapax. Ambulatory feet rather short. Length of the carapax in the male, 1.02; breadth, 0.8 inch; (spines included.)

St. Thomas. A. H. Riise.

Pericera diplacantha, nov. sp.

Body pubescent and provided with curled hairs above as in *P. subparallela.* Carapax subtrigonal, narrow; back protuberant. Lateral process or spine rather long, and double, seeming to consist of two spines, one above the other, connected nearly to their tips by a web-like connecting lamina, concave anteriorly, convex posteriorly. Antero-lateral margin concave, unarmed except with a small hepatic tubercle. There are five conical tubercles on the posterior half of the back, and a few minute ones interspersed. Gastric region strongly inclined anteriorly, with the frontal region. The rostrum forms nearly one-third the length of the carapax; horns very long, slender, cylindrical, acute, divergent, but at base connected by a web-like lamina for one-fifth their length. The anterior spine of the basal joint of the antennæ is very minute, not seen from above. Orbital tubes moderately protuberant; præorbital tooth obtuse and not prominent. Length of the carapax in a female, 1.08; breadth, spines included, 0.8, spines not included, 0.55 inch.

It is similar in general character to *P. subparallela*, but easily distinguished by the greater length of the rostrum, and the duplex character of the lateral spines.

St. Thomas. A. H. Riise.

Pericera cornuta.

Pericera cornuta M. Edw., Hist. Nat. des Crust., ii. 355. Illust. Cuv. Regne Anim., pl. xxx. f. i. Gibbes, Proc. Am. Assoc. 1850, p. 172.

This species is probably generically distinct from the triangular *Periceræ.* It was found at Key Biscayne, Fla., by Dr. Cooper.

Anaptychus,* nov. gen.

Carapax triangularis, latior quam longior; marginibus lateralibus antero-lateralibusque laminiformibus, supra bases pedum expansis ut in genere *Huenia*, et maxime dentatis; lateribus sublaminis perpendicularibus. Orbitæ completæ, parvæ et profundæ, sed non tubulares. Oculi retractiles et sese latentes. Rostrum et antennæ externæ eis generis *Microphryos* similia. Rostrum longulum, bifidum. Antennarum externarum spina articuli basalis longa acuta, cornum rostri valde simulans; pars mobilis aperta. Spina præorbitalis saliens acuta; angulus orbitæ externus dentiformis, minutus; fissuræ orbitales superiores apte clausæ, inconspicuæ. Maxillipedum externorum endognathi merus latior quam longior, angulo externo acute prominens, angulo interno sinuatus ad palpum recipiendum; exognathus latus, intus dente valido aperto armatus.

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* ’Αναπτὺχος, expansus.

Anaptychus cornutus, nov. sp.

Plate II. fig. 1.

The upper surface of the carapax is nearly level, but the gastric, cardiac, and inner part of the branchial region are slightly protuberant. There are also nine low tubercles on the gastric region. Surface covered with minute tufts of very short setæ. Antero-lateral margin with three large triangular sub-laminiform teeth behind the orbits, separated from each other by regularly curved sinuses. Posterior margin with a crest, interrupted on each side; the middle portion being arcuated and fimbricated with four pencils of stout longish setæ. Rostrum forming nearly one-fourth the length of the carapax, and cleft nearly to its base; horns acute. Chelipeds a little longer than the first pair of ambulatory feet, but scarcely thicker; meros with five or six blunt, somewhat laminiform spines; carpus tuberculated above; hand unarmed, minutely granulated; fingers scarcely gaping, minutely toothed within, tips not spoon-shaped. Inferior surface with stout setæ. Abdomen as in allied forms, widened near the base. Length of carapax in a male, 1.00; breadth, 1.24 inch.

Found in Pinacate Bay, near Guaymas, Gulf of California, by Capt. C. M. P. Stone.

Herbstia parvifrons.

Herbstia parvifrons Randall, Jour. Acad. Nat. Sci. Philad. viii. 107.

Our specimen is an adult male, in which the carapax is 0.67 inch in length, the chelipeds 1.17, and the first pair of ambulatory feet 0.93 inch. It agrees pretty well with Randall's description, except that the carapax is naked, and the hands entirely destitute of spines, with a strong tooth on the dactylus in the gape of the fingers. All the spines are blunt at the tip.

It was taken at Cape St. Lucas by Mr. Xantus.

An attentive consideration of the characters of the rostrum, orbits, and antennæ, as well as of the excavated fingers, leads us to refer the genus *Herbstia* to the vicinity of *Mithrax*, rather than to that of *Pisa* and *Hyas*, where it has hitherto been placed.

Herbstia depressa, nov. sp.

Carapax much depressed, generally covered with sordes adhering to a slight pubescence easily detached, beneath which the surface is glabrous, and less tuberculose than in *H. condyliata.* A median protuberance on the gastric, and one on the cardiac region; two tubercles on the intestinal region in a transverse row. Lateral and posterior margins armed with small subspiniform tubercles. A stout spine on the hepatic region. Rostrum rather short and broad, cleft for one half its length; horns triangular, acute. Frontal region and surface of the rostrum with a median longitudinal sulcus between two short prominent ridges. Præorbital teeth, orbits, and antennæ, nearly as in *H. condyliata.* Basal spine of external antennæ long, projecting almost as far as the horns of the rostrum. Exognath of external maxillipeds broad, fusiform, almost angular at middle of the external margin. Chelipeds shorter than the first pair of ambulatory feet; meros armed with one row of spines, and elsewhere smooth; carpus with numerous very short spines on the upper surface; hand glabrous. Ambulatory feet slender, hairy above;—those of the second pair two-thirds longer than the carapax; meros-joint in all armed with spines above, and sometimes below. Length of carapax in a male, 0.38; breadth, 0.3 inch.

It differs from *H. condyliata* in its broader carapax, and in the armature of the more compressed meros-joint of the ambulatory feet.

It resembles much more closely the Lower Californian species noticed above, but is very much smaller (supposing our specimens to be adult), with fewer and more acute spines, and much longer and more slender ambulatory feet.

Found at St. Thomas by Mr. Riise.

Mithraculus coronatus.

Cancer coronatus Herbst, Naturg. d. Krabben und Krebse, i. 184, pl. xi. f. 63.

This species is remarkable for its triangular shape and great breadth, the carapax being one-third broader than long. It is allied to *M. sculptus*, but is differently sculptured, the oblique furrows being deeper and the tubercles less numerous. The gastric region also is more convex and much less smooth. Front narrower. Antero-lateral margin straight, with three tuberculiform teeth, the posterior one forming the sharply prominent lateral angle. Meros-joint of the cheliped tuberculose above, with two teeth on the inner margin, very short, and not spiniform. Fingers less gaping than in *M. sculptus*. Length of the carapax in the male, 0.76; breadth, 1.05; proportion, 1 : 1.39.

Found at the Tortugas, Fla., by Mr. Wurdemann and Dr. Whitehurst, and at Aspinwall, Central America, by the Rev. J. Rowell.

Mithraculus cinctimanus, nov. sp.

Carapax subovate, nearly as broad as long, depressed, and resembling that of *M. sculptus* in sculpture; furrows of the surface, however, very shallow; protuberant parts somewhat tuberculated, but not prominently so. Surface minutely granulated, particularly near the margin; frontal region sparsely hairy. Horns of the rostrum small but rather prominent, projecting beyond the præorbital teeth or angles, and beyond the spine of the basal joint of the antennæ. Lateral margin armed with four teeth, besides the angle of the orbit; teeth minute, acute. Orbits deep; inner and outer angles prominent. The anterior margin of the very broad basal joint of the antennæ is bidentate, the inner tooth minute, the outer somewhat unciform, curving inward at tip. Chelipeds of moderate size; meros unarmed within; carpus with three or four minute tubercles; hand smooth, white, encircled with a broad median ring or band of mahogany-color; fingers stout, also annulated; dactylus armed with one tooth within; no tooth on the pollex or immoveable finger. Feet pilose with capillary setæ. Length of carapax in the male, 0.63; breadth, 0.62 inch.

Found at the Tortugas by G. Wurdemann, and at St. Thomas by A. H. Riise.

Mithraculus denticulatus.

Mithrax denticulatus Bell, Trans. Zool. Soc. ii. 54, pl. xi. f. 2.
Mithraculus denticulatus White, Cat. Brit. Mus. Crust. 1847, p. 7.

Found at Cape St. Lucas by Mr. Xantus. Bell's specimens were from the Gallapagos Is.

Mithrax verrucosus.

Mithrax verrucosus M. Edwards, Mag. de Zool. 1832, pl. iv. Hist. Nat. des Crust. i. 321.

Horns of the rostrum very short, blunt. Carapax naked, closely covered with flattened granules; marginal spines blunt, tuberculiform. Basal joint of the external antennæ three-spined, spines blunt, tuberculiform. Notch of the meros-joint of the outer maxillipeds very broad and shallow. Hands smooth above.

Found at Key Biscayne by Mr. Wurdemann, and at the Tortugas by Dr. Whitehurst.

Mithrax aculeatus.

Cancer aculeatus Herbst, Nat. d. Krabben und Krebse, pl. xix. f. 104.
Mithrax aculeatus M. Edw., Hist. Nat. des Crust. i. p. 321.

This is a setose species, to which the name *hispidus* would apply much better than to the species called by that name. It is shorter and broader than *M. spinosissimus*, and belongs to the same group with *M. verrucosus*, having the basal joint of the antennæ three-spined; the spines sharp. Carapax covered with depressed granules, much crowded; marginal spines sharp, sometimes armed with a supplementary spinule or two near their tips. Hands more or less spinose above near the base.

It has been found at the Tortugas, at Aspinwall, at St. Thomas, and at Barbados.

Mithrax spinosissimus.

Maia spinosissima Lamk. An. sans Vert. v. 241.
Mithrax spinosissimus M. Edw., Mag. de Zool., i. 321, pl. 2, 3.
Gibbes, Proc. Am. Assoc. 1850, p. 372.

This is the largest species of the genus. The carapax is margined with spines bifurcated at their tips. Basal joint of the antennæ broad, two-spined. Horns of the rostrum rather longer than in other species. Superior margin of the hand spinulose towards the base.

It is very abundant on the Florida Keys, from Key Biscayne southward.

Mithrax hispidus.

Cancer hispidus Herbst., Nat. d. Krabben und Krebse, pl. xviii., f. 100.
Maia spinicincta Lamk.
Mithrax spinicinctus Desm., p. 150, pl. xxiii., f. 1, 2.

Mithrax hispidus M. Edw., Hist. Nat. des Crust., i. 322.
Gibbes, Proc. Am. Assoc. 1850, p. 172.

Carapax naked, punctate, not granulated, broadly triangular. Marginal spines tuberculiform, excepting the posterior ones, which are spiniform. Basal joint of the external antennæ narrower than in allied species, and armed with only two spines, which are tuberculiform. Hands smooth above.

Found at Key Biscayne, Fla., by Mr. Wurdemann, and at the Tortugas by Capt. Woodbury.

Mithrax tuberculatus, nov. sp.

Carapax naked, tuberculated; tubercles more or less prominently granulated, most so in the young. Margin armed on each side with a strong unguiform spine or tooth curved forward. Between this lateral spine and the orbit, there are two large, well-rounded tubercles, whose distance from each other about equals their diameter; the posterior one is largest and most prominent. On each side of the lateral spine (before and behind it) there is also a smaller marginal spine or sharp tooth. Front narrow; horns of the rostrum short, blunt, scarcely more prominent than the anterior tooth of the basal joint of the antennæ. This joint is triangular, narrowing before, and is armed on the under side of the orbit with another, a lateral tooth, very small. A small tooth, posterior to this, scarce belongs to the antennal joint. Pterygostomian ridge or margin tuberculated. Meros-joint of the external maxillipeds with a right-angled notch at the inner apex for the insertion of the palpus. Chelipeds naked; meros tuberculated; carpus sparsely granulated; hand smooth; fingers scarcely gaping, and unarmed within, except that there is a tooth on the dactylus in old specimens. Ambulatory feet thick, subcylindrical, nearly naked, short-spinose or granulated above, tomentose below. Dried specimens are cream-colored, mottled with carmine. In old specimens the carmine predominates. In a large male, the carapax measures 1.37 inch in length, and 1.67 in greatest breadth.

It approaches nearest to *M. hispidus*, with which it agrees nearly in the front, orbits, antennæ, etc., but it is easily recognised by the granulated tubercles of the carapax.

It inhabits the shores of Cape St. Lucas, L. California, where it is very abundant, according to Mr. Xantus.

Teleophrys.

Teleophrys Stimpson, Silliman's Am. Jour. Sci. 2nd ser., xxix. p. 133.

This genus is allied to *Mithrax* proper, but is distinguished by the character of its orbits, which have the superior and exterior margins entire, and not armed with tubercles or spines. There is sometimes an indication of a superior fissure entirely closed up, but there is no trace of an exterior one. The basal joint of the external antennæ is rather narrow for the group to which this genus belongs, tapering anteriorly, armed with a slight tooth at the antero-exterior angle, and another still smaller at the middle of the outer margin. Meros-joint of the external maxillipeds broader than the ischium, and three-fourths as long, and notched at the internal angle, for the reception of the palpus.

Teleophrys cristulipes, nov. sp.

Pl. II. fig. 2.

Carapax triangular in front, laterally and posteriorly rounded. Gastric and cardiac regions moderately protuberant; the former crossed at the middle by a transverse row of four small tubercles. Branchial region deeply separated from the hepatic, sparsely tuberculated, with one high tubercle near the lateral extremity, and four short spines, curving forward, on the lateral margin. Front narrow; rostrum very short, slightly bifid. External antennæ two-thirds as long as the carapax. Feet rather broad, naked above, and covered with lamelliform spines or short, leaf-life crests, often somewhat imbricated. Chelipeds with the crests on the meros and carpus less developed than on the ambulatory feet; hands compressed, smooth, cristate above and below; fingers gaping, with excavated tips; pollex or immoveable finger with two minute teeth on the inner margin; dactylus one-toothed within. Length of carapax in a male, 0.3; breadth 0.32 inch.

Cape St. Lucas. J. Xantus.

Eucinetops,* nov. gen.

Rostrum parvum, bifidum, parum deflexum. Oculi longissimi, margines carapacis multo superantes. Orbitæ parvæ, basin pedunculi oculorum solumque includentes; angulo externo acuto spiniformi; margine superiore unifisso, dentibus spinisque destituto. Fossæ antennulariæ non profundæ, marginibus obtuse rotundatæ. Antennarum externarum articulus basalis parvus, angulo externo dente uno minuto armatus; pars mobilis depressa, articulis primo secundoque perlatis. Epistoma perbreve vel nullum. Maxillipedes externi eis *Micippæ* vix diversi, sed meri angulo externo prominentiore, angulo interno minus sinuato; palpo basi turgido; exognatho antrorsum endognathum superante.

This genus is allied to *Micippa.* It is remarkable for the great length and mobility of its eyes, which may be thrown forward, upward, or even backward over the carapax.

Eucinetops lucasii, nov. sp.

Pl. II. fig. 3.

Body and feet hairy above. Carapax oblong, subquadrate, with very uneven surface, not granulated, much depressed between the branchial and hepatic regions; gastric region strongly prominent, with three small tubercles in a transverse row across the middle. Protuberant parts of frontal region clothed with curled hairs. Horns of the rostrum bluntly rounded at the extremities. Lateral margins of the carapax without teeth or spines. Feet moderate, cylindrical, unarmed. Inferior surfaces short-pubescent, not densely so.

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* **Εὐκίνητος, facile mobilis; ὤψ, oculus.**

The specimen above described is a female, in which the length of the carapax is 0.36; the breadth, 0.27 inch.

With the above there are certain male specimens which may belong to a different species, being smaller and narrower, with the horns of the rostrum acutely pointed, and the external antennæ narrower, with the external angle of the first moveable joint considerably produced. The chelipeds are large, much compressed, and crested; carpus with two slight crests confluent posteriorly in a projecting angle or point; hand rather broad, flat, tapering to the slender fingers, which are not gaping. Dactyli of the ambulatory feet much shorter than in the female. It is difficult to ascertain the color; it is apparently pale orange; but there is a distinct red patch on the dactyli of the ambulatory feet at the middle.

The specimens were all collected at Cape St. Lucas by Mr. Xantus.

Othonia sexdentata.

Othonia sexdentata Bell, Trans. Zool. Soc., ii. 56, pl. xii., f. 1.

This species has been hitherto known only from the Gallapagos Islands. Our specimens were collected at Cape St. Lucas by Mr. Xantus. They agree in all respects with Bell's description and figure. *O. sexdentata* is the analogue of *O. aculeata* of the east coast, from which it differs in the numerous granules on the posterior part of the carapax, etc.

Inachoides laevis, nov. sp.

Carapax mostly smooth, and covered with a soft pubescence easily removed. Gastric and branchial regions protuberant, rounded, glabrous; cardiac with a single median tubercle. Rostrum rather long, with a styliform extremity as long as the thicker, tapering, basal half. Post-ocular spine very small, blunt. Hepatic region conical, armed at the apex with a short, deflexed spine. There are two or three tubercles on the infero-lateral regions, in front of the bases of the chelipeds. Outer maxillipeds with a sharp longitudinal denticulated ridge on the ischium-joint; antero-interior corner of the meros sharply projecting forwards. Dactyli of the posterior three pairs of feet falciform, equal. Length of the carapax in the male, 0.45; breadth, 0.32 inch.

It differs from *I. microrhynchus* in the smoothness of its carapax.

Found at Panama, by the Rev. J. Rowell.

Collodes,* nov. gen.

Carapax ovato-triangularis; rostro brevi, bifido, cornibus approximatis. Oculi mediocres, ad processum post-ocularem vel marginem posteriorem orbitæ retractiles, non sese latentes. Antennarum articulus basalis angustus, paullo contortus, antrorsum bidentatus, dente uno sub altero sito; pars mobilis longa, aperta. Maxillipedes externi eis *Microrhynchi* fere similes, mero quam ischium non angustiore, antrorsum profunde inciso, angulo interno sub basin palpi valde prominente acuto. Chelipedes mediocres. Pedes ambulatorii breves, toti prehensiles, dactylis valde gracilibus, longitudine articulum penultimum adequantibus et ad eum retractilibus. Segmenta quintum ad septimum abdominis feminarum coalita.

The orbit in this genus is incomplete; the postero-superior limb is, however, present, and is formed by the strong post-ocular process, which is separated from the præorbital arch by a deep, open marginal fissure. The genus differs from *Microrhynchus* in its feet, orbits, and rostrum; from *Achæus*, in its post-ocular or orbital process, and in its external maxillipeds; from *Achæopsis*, in its prehensile anterior ambulatory feet, and in the broader meros-joint of the external maxillipeds, with sharply projecting internal angle; from *Eurypodius* and *Ore-*

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* From κολλώδης, tenax, in allusion to the tenacity with which the animal adheres to submarine objects with its strongly prehensile or ancoral feet.

gonia, in its short rostrum and feet; from *Podochela*, in its short feet, and its post-ocular process.

Collodes granosus, nov. sp.

Pl. II. fig. 4.

Carapax nearly naked, conspicuously granulated, especially on the branchial regions; granules rather large and distinctly prominent. An erect obtuse spine on the gastric region, one on the cardiac, and one on the basal joint of the abdomen. The anterior half of the cardiac region and the sulci or depressed parts of the carapax generally, are smooth and glabrous. Rostrum subtriangular, fissured; tip minutely bifid. A minute tooth on the superior arch of the orbit. Chelipeds weak. Ambulatory feet rather depressed, ciliated, dactyli hairy. Margin of sternum raised around the egg-cavity in the female, in which sex the abdomen is strongly indurated, with the outer surface covered with closely-set granules.

The only specimen in our possession is a female, in which the length of the carapax is 0.36; the posterior breadth, 0.32; the length of the first pair of ambulatory feet, 0.5 inch.

Found at Cape St. Lucas, by Mr. Xantus.

Podochela,* nov. gen.

Carapax depressus, elongato-triangulatus, antrorsum valde productus. Regio gastrica angusta, tumida. Rostrum breve integrum, triangulatum vel arcuatum. Oculi non retractiles, transversim porrecti, longe salientes. Antennarum externarum articulus basalis angustus, medio longitudinaliter sulcatus, apice angustatus simplex, dente non armatus; pars mobilis gracilis, aperta. Maxillipedum externorum merus quam ischium multo brevior, plerumque eo quoque angustior, latitudine vero admodum variabilis, apicibus obtusis vel productis, apice interno plus minusve inciso; palpo prosarthroideo. Epistoma prælongum. Chelipedes mediocres; mero curvato, marginibus ciliatis. Pedes prælongi, robusti vel graciles, subprehensiles, manu sub-cheliformi plus minusve instructi interdum

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* Ποὺς, pes; χηλη, chela.

valida, ei *Oncinopi* simili. Dactyli pedum ambulatoriorum primi paris gracillimi, uncinati; reliqui falciformes. Feminæ sternum concavum, profundum, marginibus elevatis, laminato-dilatatis,—capsulam efficiens; abdominis segmentum primum sat grandis; secundum, tertium quartumque brevissima; quintum, sextum, septimumque coalita.

This genus is allied to *Achæus*, but the rostrum is entire, and the first two pairs of ambulatory feet are sub-prehensile. It appears to be peculiar to the West Indies, as four species are known, all of which are found only in that province.

Podochela grossipes, nov. sp.

Pl. II. fig. 5.

Body everywhere short-pubescent; feet setose. Rostrum acuté, regularly triangular, very little longer than broad at base, setose. Meros-joint of the external maxillipeds oblong, much narrower than the ischium, with the apices obtusely rounded, inner one very slightly incised, incision broad and shallow. Chelipeds with the hand much inflated; fingers much shorter than the palm, slender, gaping, and annulated with crimson near their tips. First pair of ambulatory feet very robust, with a single series of very short small tufts of curled hair along the upper side; penult joint very thick, and armed on the inferior edge with a distinct tooth or thumb-process, against which the extremity of the dactylus closes. The rest of the feet become progressively shorter and more slender posteriorly, and have much shorter hands. In the penult and the last pair, the penult joint is scarce longer than the dactylus, much curved, and concave within, with the thumb-process at the base;—the dactylus is almost always closed against this process, and can be opened only to a limited extent; so that the last two joints are transformed into a strongly subcheliform or anceral hand, which projects at a right angle from the preceding joint, and resembles, in every respect, that of the posterior feet of *Oncinopus.*

This description is drawn up from a male specimen in which the length of the carapax is 0.56; its posterior breadth 0.41; length of first ambulatory feet, 1.39; of posterior pair of feet, excluding dactylus, 0.68 inch.

This species, which we regard as the type of the genus, was taken at the Island of St. Thomas, W. I., by Mr. Riise.

Podochela macrodera, nov. sp.

This species has considerable resemblance to *P. grossipes*, but differs in the following particulars. Rostrum shorter. Meros-joint of external maxillipeds much shorter and broader, with the anterior angles prominent and laminate. Chelipeds with less inflated hands; fingers neither gaping nor annulated with pink. Ambulatory feet more slender; the penult joint in the first pair especially much longer and more slender, and with no distinct thumb-process on its inferior edge; hands of the posterior two pairs more pedunculated and less geniculated, the thumb-process being nearer the middle of the penult joint, and thickly setose. Length of the carapax in a male, 0.421; posterior breadth, 0.30 inch.

The specific name is suggested by the great length of the neck, or peduncle of the summit upon which the eyes and antennæ are supported; although this is almost equally long in all the other species.

It was found at St. Thomas, by Mr. Riise, and at Key Biscayne, Fla., by G. Wurdemann, Esq.

Podochela riisei, nov. sp.

Pl. II., fig. 1.

Of this species we have but a single example, a female. The carapax is narrow anteriorly, but depressed and broadly expanded posteriorly at the bases of the ambulatory feet. Gastric region very tumid, with a few setigerous tubercles: setæ crispate. Cardiac region sharply prominent, tuberculiform. Hepatic region with a strong, deflexed, almost laminiform lateral tooth. Frontal region protuberant, setigerous. Rostrum depressed much below the level of the frontal region, broader than long, nearly horizontal, sub-laminiform, naked, with a slight median carina; margin regularly arcuated, semicircular, entire. Basal joint of the external antennæ with a high laminiform crest on each margin, the intervening surface being deeply concave;—these crests converge and join each other at the anterior extremity of the joint, and the moveable part is inserted above the point of juncture. Meros-joint of the external maxillipeds with the anterior angles expanded and prominent as in *P. macrodera.* Chelipeds with slender hand and long fingers not gaping. Ambulatory feet slender, very hirsute on the exterior half of their length; first pair stouter than the others, especially in the meros-joint. The erect laminiform expansions of the sternum, which form the sides of the egg-cavity, are high and overlapped by the abdomen when shut down;—at the anterior extremity the lamina is deeply incised in the base, forming two triangular points between the bases of the chelipeds. Length of the carapax in our specimen, 0.7; breadth posteriorly, 0.58; length of first pair of ambulatory feet, 2.05; of the posterior pair, 1.28 inch.

This species and the next depart widely from the type in the great slenderness of the ambulatory feet, which, also, are not distinctly prehensile, the thumb-process of the penult joint, even in the posterior pairs, being almost or entirely obsolete, and when present situated below the middle of the joint. These characters render the group at first sight so distinct that we had described it in manuscript as a genus under the name of *Podonema*, but we are now inclined to doubt the propriety of such a separation and to regard the differences as only those of degree. *P. macrodera* is in fact a species intermediate in character between the two groups.

P. riisei was found at the Island of St. Thomas, by A. H. Riise, Esq., after which indefatigable investigator of West Indian Natural History we have named the species.

Podochela deflexifrons, nov. sp.

Front and rostrum deflexed; rostrum not as long as broad. Neck much constricted. Eyes very large. Hepatic tooth abruptly prominent downward. Chelipeds moderate; lower edge of meros and ischium fringed with long, parallel, incurving pairs. Ambulatory feet thread-like, thin, and flexible; the first pair more than three times as long as the carapax, and with a very minute dactylus; posterior pairs becoming progressively shorter, with a compressed dactylus one-fourth the length of the penult joint. Length of the carapax, 0.28; breadth, 0.2; distance between tips of eyes, 0.18; length of first pair of ambulatory feet, 2 inches.

It is very closely allied to *P. riisei*, and is perhaps only a variety, but the deflexed front and filiform feet seem to be good distinctive characters.

Metoporhaphis,* nov. gen.

Carapax triangularis, superficie inæqualis, ei *Stenorhynchi* similis. Rostrum integrum, longum, exile. Antennæ externæ longæ, parte mobili aperta. Antennulæ ut in *Leptopodia*, basi non cochleariformes. Maxillipedes externi eis *Leptopodiæ* fere similes. Pedum ambulatoriorum dactyli fere recti, ciliati.

The type of this genus is the *Leptopodia calcarata* of Say, which we have found upon examination to differ generically from *Leptopodia* in its uneven or protuberant carapax, exposed external antennæ, etc.

Metoporhaphis calcarata.

Leptopodia calcarata Say, Jour. Acad. Nat. Sci. Philad. i. 455.
Gibbes, Proc. Am. Assoc. 1850, p. 169.

We have dredged this species off the mouth of Beaufort Harbor, N. C., in seven fathoms, shelly bottom.

Epialtus sulcirostris, nov. sp.

Body and ambulatory feet smooth and naked. The carapax is widest at the posterior of the two lateral teeth, which are rather acute at their tips. Præorbital tooth small but distinct and rather prominent. The rostrum in the outline of its upper side, is oblong, in length about equalling the distance between the tips of the præorbital teeth, with sides slightly converging to a place near the extremity, where they abruptly run to a triangular point. In its other characters, the rostrum is thick, with its upper and lower surfaces a little concave; the lower surface is triangular in shape, narrower than the upper, and separated from it by a deep lateral groove. Chelipeds pubescent; carpus acutely carinated externally; hand broad, compressed, with the upper margin acute or crested, crest laminiform, very prominent above the insertion of the dactylus. Ambulatory feet slender, with no vestige of a thumb-process on the penult joint, excepting in the first pair. Length of the carapax in a male, 0.36; breadth, 0.27; length of first pair of ambulatory feet, 0.5 inch.

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* Μέτωπον, frons; ῥαφίς, acus.

It is allied to *E. affinis* and *E. bituberculatus*, but wants the two gastric tubercles, and also differs in the character of the rostrum.

Found at Cape St. Lucas, by John Xantus, Esq.

Epialtus longirostris, nov. sp.

Allied to *E. affinis*, but distinguished by the length of its rostrum, which forms more than one-fourth the entire length of the carapax, and is slender with parallel sides and truncate tip. The two gastric tubercles are distinct. Post-gastric and cardiac regions rather prominent. Chelipeds as long as the first ambulatory feet, and rather slender; hand much more elongated than in *E. affinis*. Ambulatory feet slender, with no tooth or process on the penult joint except a very slight one in the first pair. Length of the carapax in the male, 0.34; breadth, 0.22 inch.

St. Thomas. A. H. Riise.

Mimulus. nov. gen.

Carapax planulatus, plus minusve subpentagonus, margine antero-laterali valde expansus, laminatus et bilobatus, lobis arcte approximatis.

Rostrum horizontale, breve, bifidum. Orbitæ inferne incompletæ, superne dente præorbitali et postorbitali præditæ. Oculi retractiles, non sese latentes. Epistoma mediocre. Maxillipedum externorum merus brevis, angulo externo obtusus, angulo interno incisus; exognathus extus dilatatus. Chelipedum manus valde compressa, laminato-cristata. Pedum ambulatoriorum articulus penultimus dente setoso inferne ad medium armatus. Pedes ambulatorii primi paris prælongi.

This genus is near *Epialtus*, with lamellar expansions of the sides of the carapax as in some *Hueniæ*. The exognath of the outer maxillipeds has a strong angular dilatation of the outer margin near its extremity, so that this margin between the angle and the tip is concave.

Mimulus foliatus, nov. sp.

Pl. III., fig. 1.

The projecting lateral laminæ form more than one-third the width of the carapax. The posterior one is the larger, and it generally overlaps the anterior one at the lateral fissure; its posterior angle projects, especially in young specimens, giving a concave outline to the lateral margin. The anterior side of the anterior lamina is transverse, and forms a prominent angle with the outer side. There is a post-orbital tooth, at base separated by an open fissure from the superior margin of the orbit. Upper side of the carapax somewhat flattened, with the lateral expansions a little reflexed, the gastric region a little convex, and the surface smooth, covered and concealed by a thin reddish coat of minute pubescence easily removed. Rostrum partly clothed with crispate setæ. Pterygostomian ridge (or branchiostegian margin) armed with three or four low tuberculiform teeth. Chelipeds large; meros and carpus angular but unarmed; inner margin of carpus projecting, laminiform, arcuated; hand and fingers much compressed; fingers gaping in their basal half. Ambulatory feet of the last three pairs naked, angular, not compressed; penult joint obtusely crested above. Ambulatory feet of the first pair compressed, especially in the young, and angular; ischium and meros armed with tubercles or spines below, most prominent in the young;

penult joint lamelliform, acute above; dactylus long and broad, sublamelliform. Length of the carapax in a male, 1.1; breadth, 1.33.

In general appearance and character of the feet, this species has some resemblance to *Huenia heraldica* of De Haan, but is easily distinguished by the bifid rostrum destitute of a vertical lamina, by the post-orbital tooth, the different maxillipeds, etc. It is a rare species, taken from the stomachs of percoid fishes, ("Cabesones") caught off Monterey, Cal., by A. S. Taylor, Esq.

Lambrus crenulatus.

Lambrus crenulatus Sauss., Crust. nouv. des Antilles et du Mexique, p. 13, pl. i. f. 4.

Found at the Tortugas, Fla., by Capt. Woodbury.

Lambrus triangulus, nov. sp.

The carapax is of the shape of an equilateral triangle, the posterior margin being nearly straight, and scarcely exceeding the antero-lateral sides in length. This results from the strong projection of the dentated posterior corners of the branchial regions, which almost conceal the ambulatory feet. Antero-lateral margin with about twelve very small granulated teeth, of which three are on the small rounded hepatic region. Surface ornamented with conical tubercles variable in number and size. Rostrum prominent, obtuse, triangular. The base of the movable part of the external antennæ is protected on each side by an over-arching tooth, one arising from the lower margin of the orbit, the other from the anterior corner of the epistome. In the outer maxillipeds the ischium is granulated, the meros tuberculated. Chelipeds rather short, strongly angular and dentated; hand granulated below, but nearly smooth above between the crests, which are high, and unevenly eight- or nine-toothed; the teeth denticulated, the middle one largest. Ambulatory feet perfectly smooth and glabrous; dactyli pubescent. Length of the carapax in a female, 0.55; breadth, 0·69 inch.

Cape St. Lucas. J. Xantus.

Cryptopodia granulata.

Cryptopodia granulata Gibbes; Proc. Am. Assoc. 1850, p. 173 and Proc. Elliott Soc. i. 25. (wood-cut.)

In addition to the locality (Charleston Harb.) mentioned by Gibbes, we have this species from Beaufort, N. C. and from St. Thomas, W. I.

CANCROIDEA.

Atergatis lobatus.

Cancer lobatus M. Edw., Hist. Nat. des Crust. i. 375. (?)

Our specimen is a small one, the carapax being less than half an inch in length, and not "fortement bosselée." The areolets of the carapax are granulated, and the ambulatory feet are not altogether smooth, but granulated above on the penult and antepenult joints. In other characters it agrees well with the description of Milne Edwards.

It was found at Aspinwall, by Rev. J. Rowell.

Atergatis rotundatus, nov. sp.

Carapax less broad than is usual in the genus, equally convex anteriorly and posteriorly, areolated and granulated. Antero-lateral margin crested, indistinctly quadrilobate, the lobes being separated by very slight notches, not fissures;—the marginal crest granulated like the rest of the carapax. Postero-lateral side very short. Hand of the chelipeds short, with a high lamelliform superior crest; outer surface granulated above, and ornamented with four or five granulated costæ. Length of the carapax, 0.25; breadth, 0.32 inch.

It differs from *A. limbatus* in having a narrower limb or crest of the antero-lateral margin. It is the analogue or representative of *A. lobatus* of the Atlantic side of the continent, but differs in being more convex and granulated posteriorly, having higher crests to the hands, etc.

Found at Cape St. Lucas, by Mr. Xantus.

Actaea nodosa, nov. sp.

Carapax broad, and deeply areolated both anteriorly and posteriorly; the areolets forming prominent granulated nodes, mostly of nearly equal size, and in number about forty, including those constituting the antero-lateral teeth. These nodes are strongly convex in the anterior, but flattened in the posterior regions of the carapax. The furrows separating them are wide and deep, and more or less thickly pubescent. The median gastric areolet, which in this genus is usually long and slender, reaching far forward, is in the present species almost obsolete, being represented only by its tuberculiform posterior extremity. The feet are nodose and granulated like the carapax. The outer surface of the hand is tuberculated, the tubercles being arranged, inferiorly, in three longitudinal rows. Length of the carapax in a female, 0.64; breadth, 0·97 inch.

Found at the Tortugas, Fla., by Dr. Whitehurst.

Actaea sulcata, nov. sp.

Upper surface of the carapax divided into thirty flattened and granulated lobules (besides the small ones around the orbits), separated by deep pubescent sulci. The posterior lobules are less prominent, more distinctly granulated, and sometimes concealed by pubescence. Chelipeds above nodose like the carapax; hands and fingers, at base, strongly granulated externally. Ambulatory feet longitudinally sulcated, but not granulated. Color bright-red, somewhat maculated or mottled with white. Length of the carapax in a female, 0.37; breadth, 0.56 inch.

It is somewhat nearly allied to *A. nodosa*, but the lobules or nodes of the carapax are less prominent and less distinctly granulated.

In this species there is some approach to excavation in the tips of the fingers, that would perhaps require its removal to the section *Actaeodes* of Dana, which, however, we can scarcely consider a distinct generic group.

Found at Cape St. Lucas, by Mr. Xantus.

Actaea labyrinthica, nov. sp.

This species is very closely allied to the Atlantic species, *A. erosa* Stm., differing only in being less minutely eroded or vermiculated, the prominent parts between the principal furrows of erosion being flattened and smooth; while in *A. erosa* these prominences are sharp and themselves eroded. On the outer surface of the hands the prominences are smooth, mammilliform tubercles.

In color this crab is variegated with yellow and carmine. Length of the carapax in a female, 1.0; breadth, 1.42 inch.

Found at Panama, by the Rev. J. Rowell. For additional specimens I am indebted to Mr. W. H. Edwards.

Xantho bella, nov. sp.

Pl. III., fig. 2.

Carapax rather broad; proportion of length to breadth about 1:1.50. It is somewhat octagonal in shape, the antero-lateral margin being angular at the middle, where it is divided into two equal portions;—the anterior one straight, oblique, and entire, with the exception of a small lobe scarcely projecting near its anterior extremity; and the posterior portion nearly longitudinal, and armed with three strong triangular teeth, the middle one being most prominent. The postero-lateral margin is longer than the antero-lateral. Surface distinctly areolated, smooth, and glabrous, except near the anterior margins, where it is minutely rugose or granulated. Front moderately projecting, deeply fissured at the middle. The infero-external fissure of the orbit is as well marked as in *X. florida*, or as in some *Panopei*. Chelipeds smooth and glabrous; hand short, with a basal tooth on the superior margin of the palm, projecting inward. Ambulatory feet mostly smooth and glabrous (rarely pubescent); penult and antepenult joints compressed, obtusely cristate above, with an undulated margin; dactyli with rather long pubescence. Color crimson or beet-red; carapax sometimes lighter in color, or yellowish, maculated with deep red. Length of the carapax in a male, 0.54; breadth, 0.80 inch. In another, length, 0.56; breadth, 0.89.

Northern specimens are more transverse, rougher, more pubescent, and more sober in coloration than those found in warmer latitudes.

Found at Monterey, Cal., by Mr. A. S. Taylor, and at Ft. Townsend, Puget Sound, by Dr. Suckley.

Xantho planissima, nov. sp.

Carapax perfectly flat above, smooth and glabrous, excepting near the frontal margins, where it is somewhat punctate in transverse rugæ. Regions moderately well defined, but not themselves areolated, excepting the gastric in its anterior part. Antero-lateral margin four-toothed, teeth moderate. Chelipeds unarmed (excepting the tooth at the inner angle of the carpus); surface smooth, punctate above; meros minutely granulated above, near the apex; hand compressed, broad; fingers black, with light-colored tips; pollex broad, with its black patch extending some distance on the palm. Ambulatory feet smooth, compressed, pubescent toward their extremities. Color a very dark bluish-grey, marbled posteriorly. Length of the carapax in a full grown male, 0.3; breadth, 0.46 inch.

Cape St. Lucas. J. Xantus.

Xantho lamellipes, nov. sp.

Carapax smooth, flattened, and somewhat octagonal in outline, the antero-lateral margin having a strong angle or shoulder on the hepatic region, just before the indistinct cervical suture. The broadest part of the carapax is at this shoulder, and between it and the orbit, the margin is thick, obtuse, perfectly straight and smooth. Behind the shoulder-tooth there are two small teeth on the antero-lateral margin, rather sharp and crested. Front deflexed, with a reticulated surface. Sub-hepatic regions also reticulated, that is, covered with minute cavities the parietes of which form a fine network. Chelipeds angular, with reticulated surface; upper side of carpus somewhat dilated, with a strong outer, inner, and posterior tooth or angle. Ambulatory feet very much compressed, almost laminiform, with sharp, smooth, lamelliform crests above. In the penult and antepenult joints of the first two pairs of ambulatory feet, there is also a longitudinal crest on the side of the feet, the spaces between the crests being deep cavities. Sternum and inferior side of feet pubescent.

It is slate-colored, with the antero-lateral margins and chelipeds reddish-white. Length of the carapax in a male, 0.25; breadth, 0.34 inch.

Cape St. Lucas. J. Xantus.

Xantho vittata, nov. sp.

Carapax depressed, rather narrow, anteriorly rather convex, and with a produced front. Dorsal surface distinctly divided into regions by sufficiently deep furrows; the gastric region subdivided into three lobules; and the branchial into two by the transverse sulcus arising at the lateral angle. Surface naked, somewhat punctate, and transversely rugulose anteriorly. Lateral and posterior margins ciliated beneath. Antero-lateral margin eight-toothed; teeth small, sharp, narrower than their interspaces at the base. Anterior tooth situated at a double interval from the angle of the orbit. External marginal lobes of the orbit prominent. Front horizontal, much projecting; margin slightly convex, not toothed, but sparsely ciliated. Chelipeds somewhat rugose above. Ambulatory feet ciliated. Abdomen in the male narrow; terminal joint scarcely longer than broad, with rounded extremity. Color yellowish-grey; carapax with eleven longitudinal stripes of red. Length of carapax in a male, 0.5; breadth, 0.67 inch.

It is allied to *X. sexdecem-dentatus*, but the dorsal surface is distinctly areolated, and the antero-lateral teeth do not touch each other at base as in that species. *X. sexdecem-dentatus* has been referred by some to the genus *Paraxanthus* of Lucas, but we cannot perceive that it is generically distinct from *X. planus*; in the front is equally prominent.

Our species was found at Panama by the Rev. J. Rowell; also abundantly at Cape St. Lucas by Mr. Xantus. The northern specimens differ from those of Panama only in their smaller size.

Xantho denticulata, nov. sp.

Carapax sufficiently broad, naked, very deeply areolated anterior to the transverse furrow, the extra-medial gastric lobules being partially divided. An oblique furrow crosses the postero-lateral slope and margin, arising from the transverse furrow half way between the middle and the lateral extremity. Antero-lateral margin armed with nine small but prominent teeth, the anterior one being situated at a lower level than the others (belonging rather to the sub-hepatic region), and separated from the angle of the orbit by a rather deep sinus. Front quadridentate; middle teeth much the largest. The lobes between the fissures of the external orbital margins are rather prominent. Præorbital tooth prominent. Latero-inferior regions granulated. Basal joint of the external antennæ rather short, but joining a process from the front. In the chelipeds, the carpus and hand are tuberculated above. Ambulatory feet smooth; a slight tooth at the superior extremity of the carpus-joint. Length of carapax in a male, 0.31; breadth, 0.44 inch.

From the character of the external antennæ this species would probably be more properly arranged in *Xanthodes*, but the carapax is broad as in the true Xanthos.

Found at Cape St. Lucas by Mr. Xantus, who has been particularly fortunate in collecting new species of a genus the name of which approximates so closely to his own.

Xanthodes taylori, nov. sp.

Pl. III, fig. 3.

Carapax areolated; areolets anteriorly embossed; margins of the transverse protuberances often crenulated. Front deeply quadridentate; teeth widely separated; their interspaces coarsely crenulated. There is also a crenulated transverse ridge above and parallel with the front, interrupted at the middle by the deep median sulcus of the frontal and gastric regions. Three prominent teeth on the antero-lateral margin, the anterior one bifid, the posterior one with a supplementary tooth behind it. Between the anterior tooth and orbit, the margin is obtuse or flattened, and armed with four or five tubercles. In the chelipeds the carpus and hand, above and exteriorly, are uniformly covered with rather closely-set, prominent, subglobular, rose-colored tubercles. There is a slight tendency to excavation in the tips of the fingers. Ambulatory feet spinose and setose above, setæ stiff. In the alcoholic specimen the carapax is rose-colored, like the tubercles of the chelipeds, which are set on a bluish ground; fingers black, the black not spreading upon the hand. Length of the carapax in a female, 0.72; breadth, 1.09 inch.

This pretty species was found at Monterey, Cal., in March, 1859, by Mr. Alex. S. Taylor, who writes:—"The crab is new to us here, never having been seen before;—it was found on the sand beach after a heavy storm, and lives, very likely, in deep water among sea-weeds." It is probably, like other species of the genus, an inhabitant of the laminarian zone.

Xanthodius hebes, nov. sp.

Body and feet naked with the exception of the pubescent dactyli of the ambulatory feet. Carapax smooth, moderately but not deeply areolated; surface conspicuously punctated. Antero-lateral margin smooth, obtusely rounded, obscurely quadrilobate. Front obtuse, straight when seen from above, but deeply sinuous in its margin seen from before. Subhepatic region deeply punctated or minutely vermiculated behind the orbit. Chelipeds rather short and stout, rugulose above and externally. Length of carapax, 0.52; breadth, 0.82 inch.

It approaches nearly to *X. sternberghii* in its smooth carapax, but may be easily distinguished by its obtuse antero-lateral margin.

Found at Cape St. Lucas, where it is extremely abundant, according to Mr. Xantus.

Xanthodius americanus.

Chlorodius americanus Sauss.; Crust. nouv. des Antilles et du Mexique, p. 14, pl. i. f. 5.

In a criticism of M. De Saussure's "Memoires" (Silliman's Am. Jour. Sci., 2nd Ser. xxvii. 446), we have considered this species identical with *C. floridanus* Gibbes. Having recently, however, secured numerous specimens of it, we are enabled to acknowledge the error. It is entirely distinct;—the carapax is much broader and more rounded at the lateral angle, the lobules are more protuberant, the surface is punctate, not transversely striated, the lateral teeth are less acute, and the body and feet generally, are much less hairy. The frontal margin is transversely canaliculated as in *C. floridanus.*

As this species has a strong ridge upon the palate, I have arranged it above in *Xanthodius.*

Found at the Tortugas, Fla., Capt. Woodbury; and at Barbadoes, T. Gill.

Chlorodius floridanus.

Chlorodius floridanus, Gibbes; Proc. Am. Assoc. 1850, p. 175.

This species has much resemblance to the Pacific *C. exaratus*, with which it is confounded by Dana (U. S. Expl. Exped., Crust. ii. 1554). It is, however, distinguished by the character of the frontal margin, which is grooved so as to appear double.

Very common on the Florida Keys.

Chlorodius maculatus, nov. sp.

The following description is drawn up from a single female specimen, the only one yet received. Carapax yellowish, with numerous brown spots;—narrow, evenly convex, areolated; lobules rather prominent anteriorly and antero-laterally, with nearly smooth surfaces. No transverse ridges. Surface posteriorly glabrous. Antero-lateral teeth four in number (excluding angle of orbit) equal, small but sharply prominent; interspaces broad, concave. Front prominent, sublaminiform, four-toothed; middle teeth broad; orbital teeth prominent. A tooth on the subhepatic region just beneath the first of the four antero-lateral teeth. Chelipeds short and stout, spotted with red; meros spinulose above; fingers short and stout, with large apices deeply spoon-shaped. Ambulatory feet with the last three joints very spinulose and hairy above. Length of carapax, 0.625; breadth, 0.84 inch.

It is much narrower in proportion than any other *Chlorodius* of the West Indian province.

Found at the Tortugas, Fla., by Capt. Woodbury.

Panopeus transversus, nov. sp.

Carapax very broad, moderately convex, naked, smooth except near the margins anteriorly, where it is minutely rugulose transversely, or granulated. Regions scarcely defined. Surface not uneven near the antero-lateral teeth. Front wide, scarcely at all prominent; margin somewhat undulated, the two lobes being curved and not straight or truncate. Antero-lateral margin divided by slight incisions into four teeth as in *P. crenatus*;—the first tooth, composed of the angle of the orbit coalesced with the second normal tooth, is entire and slightly convex in outline. Chelipeds minutely granulated or rugulose above; a tooth on the inner edge of dactylus at the base. Feet and inferior surfaces of the body pubescent. Terminal joint of the male abdomen small, not dilated laterally. Color a very dark brown; fingers black with white tips,—the black spreading a little upon the palm. Length of carapax in a male, 0.5; breadth, 0.75 inch.]

It is allied to *P. crenatus* of the west coast of S. America, but the carapax is broader, and less convex, with a less prominent front, etc.

Found at Panama, by the Rev. J. Rowell.

Panopeus abbreviatus, nov. sp.

Carapax broad, transversely rugose; regions well-defined but not protuberant. Front rather narrow, and but little projecting; margin seen from above, nearly straight; and obliquely truncated or bevelled, the bevelled surface being granulated. Supra-orbital fissure distinct. Antero-lateral teeth normal in number, and rather prominent. Sub-hepatic regions granulated; a slight tuberculiform prominence beneath the first antero-lateral tooth. Chelipeds smooth; surface microscopically punctated. Color yellowish or brownish; chelipeds and front margin of carapax roseate; fingers black with paler tips, the black not spreading. Length of carapax in a male, 0.525; breadth, 0.82 inch.

Found at Barbados, by Theo. Gill, Esq.

Ozius verreauxii.

Ozius verreauxii Sauss.; Rev. et Mag. de Zoologie, 1853, p. 359, pl. xii. f. 1.

Found at Cape St. Lucas, by Mr. Xantus. A large specimen, three inches broad.

Ozius perlatus, nov. sp.

Very broad, and depressed; anterior part of carapax and upper side of chelipeds rugose, the raised portions reticulating, the pits and channels deep, as if eroded. Carapax flat and smooth posteriorly, anteriorly well areolated, the anterior branchial lobule being circumscribed. Latero-inferior regions granulated. Front depressed and transversely channelled, nearly straight in a view from above, but strongly bidentate at the middle in a front view; teeth obtuse. Basal joint of the external antennæ narrow and projecting, being jammed in the inner angle of the orbit. External maxillipeds more or less pubescent; meros rather deeply bisulcated, and conspicuously notched anteriorly at the efferent aperture. Color dark reddish. Length of carapax, 1.65; breadth, 1.1 inch.

It has some resemblance to *O. verreauxii*, but is broader, more deeply areolated, and rugose, almost vermiculated anteriorly. The basal joint of the antennæ also, in *O. verreauxii*, is much broader and more flattened.

It was found in considerable numbers at Cape St. Lucas, by Mr. Xantus.

A species closely allied, and if not identical with this, is found at the island of Jamaica. It has, however, a more acute antero-lateral margin.

Daira americana, nov. sp.

Closely allied to *D. perlata*, differing only in the fingers, which in our species are not spoon-shaped but acuminate, and in the existence of tufts of setæ between the tubercles of the carapax. Length of the carapax in the male, 0.8; breadth, 1.15 inch.

This species affords another instance of the slight value of the degree of excavation of the finger tips as a distinguishing character. It should scarcely be used for families, when in this and some other instances it is not even of generic importance.

We have here removed the genus *Daira* from the vicinity of *Chlorodius* to that of *Pilumnus*, in view of the strong ridge upon the palate, and some other characters of nearly equal importance. *Daira* is especially characterized by the notch of the anterior margin of the meros-joint in the outer maxillipeds, and by the basal joint of the external antennæ not being soldered to the carapax.

Daira americana was found at Cape St. Lucas, by Mr. Xantus. The only other species known is an inhabitant of the Indo-Pacific region.

Pilumnus xantusii, nov. sp.

Carapax narrow, moderately convex, anteriorly hairy, but posteriorly short-pubescent like the abdomen. Gastric region and its principal lobules well circumscribed. Two or three very short spines on the hepatic and branchial region in a row parallel to the antero-lateral margin. Surface elsewhere either smooth or sparsely roughened with sharp grains. Front rather broad, deeply incised at the middle, but without lateral incisions; its margin armed with six small spines. Superior margin of orbit straight, ciliated, but not armed with spines; inferior margin with two or three spines toward the inner angle. Antero-lateral margin armed with five spines, regularly placed and nearly equidistant, but diminishing in size forward; the anterior one at the external angle of the orbit. Meros-joint of the external maxillipeds longer than is usual in the genus, being nearly square, and less incised at the internal angle. Chelipeds short and thick; greater hand above and externally hairy, and sparsely armed with spines; surface between the spines smooth and glabrous except toward the fingers, where it becomes granulated, the spines disappearing or becoming tubercles; lower margin and inner side near the fingers granulated. Fingers tuberculated at base. Ambulatory feet not spinous but clothed above with very stiff hairs. Color reddish; spines black; fingers black. Length of carapax in a male, 0.6; breadth, spines excluded, 0.68.

It is the western analogue of *P. aculeatus*, but differs considerably from that species in its narrower carapax, five-spined antero-lateral margin, and in the want of spines on the feet.

Found at Cape St. Lucas, abundantly, by Mr. Xantus.

Pilumnus gemmatus, nov. sp.

Surface of body and feet above covered with a cream-colored, velvet-like pubescence. Carapax distinctly areolated, and ornamented with scattered granules or small tubercles, from three to six on each areolet. Spines or teeth of antero-lateral margin very short. Two or three tubercles on the superior margin of the orbit, not acute. Lobes of the front prominent, rounded, granulated; a transverse series of long hairs above the margin. Lower margin of orbit not spinous. In the chelipeds, both hands are tuberculated above, and granulated on the outer surface. Ambulatory feet long-hairy, pubescent, and studded above with scattered granules smaller and sharper than those of the carapax and hands. The granules and spines are all of a bright ruby color, and present an elegant appearance from contrast with the whitish or cream-colored velvet in which they are embedded like gems. Length of carapax, 0.36; breadth, 0.49.

Inhabits St. Thomas; A. H. Riise. Also the Tortugas; Capt. Woodbury.

Pilumnus reticulatus, nov. sp.

In this species the carapax is less convex than is usual in the genus; both it and the feet are clothed above with short clavate setæ, closely arranged in reticulating lines enclosing small, naked, polygonal areolæ, which, on the anterior half of the carapax and on the chelipeds, are mostly each occupied by a tubercle projecting forward, but flattened on its superior and posterior surface. There are about twelve tubercles on the carapax, excluding marginal ones, and about thirteen on each cheliped. On the ambulatory feet the naked areolæ form deep cavities not occupied by tubercles; about two areolæ occupy the width of the foot. A few much longer and larger clavate setæ are dispersed among the short ones which clothe the general surface. Antero-lateral margin distinctly four-toothed, not including the external angle of the orbit; the anterior tooth is situated rather on the sub-hepatic region. A tooth on the sub-branchial region beneath the penult tooth of the antero-lateral margin. Three projecting teeth on the inferior margin of the orbit, the inner one very large, flattened on its outer surface. External antennæ long. Fingers and infero-exterior surface of hands smooth and naked; the naked part sharply defined by an oblique line on the outer surface. Length of carapax in a male, 0.25; breadth, 0.36 inch.

Inhabits St. Thomas; A. H. Riise.

Pilumnus ceratopus, nov. sp.

Body above clothed with very short tufts of pubescence, somewhat irregularly arranged, leaving many open spaces; feet much more thickly covered, with a longer hairy coat. Carapax much less convex than usual, and even flattened posteriorly, but anteriorly moderately sloping toward the margins. Regions sufficiently distinct, but neither lobulated nor tuberculated. A transverse ridge on the frontal region, interrupted at the middle. Surface naked along the anterior margins, which are obtuse and thickened. Three long, acute spines on the antero-lateral margin. Front nearly horizontal, very little projecting, and strongly sinuated at the middle. Superior margin of the orbit unarmed, but fissured at the middle; outer angle tuberculiform, projecting laterally. Inferior margin of the orbit deeply bi-lobate; lobes large, triangular, projecting; external hiatus well-marked, and armed with a tooth at the bottom. Chelipeds above, and externally, covered with short spines; anterior half of palm of hand naked, and of a bright red or purplish color. Ambulatory feet compressed, densely hairy; meros with a spine at the superior extremity; carpus with a large, smooth, procumbent, horn-like process lying upon its upper side, in front of which are three spines along the anterior margin; dactylus of the usual length. Length of carapax in a male, 0.3; breadth, excluding the spines, 0.4 inch.

This pretty little species, very peculiar in the armature of its ambulatory feet, was found at Key Biscayne, Fla., by the late Gustavus Wurdemann, Esq.

Pilumnus lunatus.

Pilumnus lunatus M. Edw. et Lucas; Voy. dans l'Am. Merid. (D'Orbigny) Crust. 20, pl. ix. f. 2.

Distinguished by its thickened, naked, anterior margins, and by the peculiar sharp lunated process on the superior margin of the carpus joint of the ambulatory feet. It has no ridge upon the palate, and should probably, with the preceding species, be separated generically from *Pilumnus*.

Found at Cape St. Lucas by Mr. Xantus, and on the west coast of Central America by Capt. Dow.

Metopocarcinus,* nov. gen.

Carapax laevis, glaber, orbiculatus, antice truncatus; regionibus non circumscriptis; margine antero-laterali fere integro, quam postero-lateralis breviore, paullo cristato, crista postice introrsum curvata, ut in *Pilumnoide.* Frons grandis, perlata, dimidiam carapacis lat. fere superans, prominens, margine recta, integra. Orbita parva, margine superne integra, subtus unifissa. Antenna externa hiatum internum orbitae occupans, articulo basali frontem non attingente. Maxillipedes externi eis *Xanthus*, etc. similes. Pedes mediocres. Abdominis maris segmenta tertium, quartum quintumque coalita.

Metopocarcinus truncatus, nov. sp.

Pl. V., fig. 4.

Carapax somewhat convex, naked, smooth and even, except that the anterior gastric lobules and two oblong longitudinal lobules on the frontal region are slightly raised. Antero-lateral margin obscurely three- or four-toothed; teeth to be seen only in a side view. Distance between inner angles of the orbits equalling more than half the width of the carapax. Inferior side of frontal margin transversely sulcate or channelled, and granulated. External antennæ very short, reaching scarcely beyond the frontal margin. Chelipeds and ambulatory feet smooth, naked, and unarmed; fingers acuminate; dactyli pubescent, with long, slender, acute unguicles. Color, pale orange; postero-lateral surfaces, above bases of feet, black; fingers of the chelipeds and dactyli of the other feet, dark colored. Length of carapax in a male, 0.18; breadth, 0.18 inch.

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* Μέτωπον, frons; κάρκινος, cancer.

Cape St. Lucas. J. Xantus.

Eriphia gonagra.

Cancer gonagra Fabr.

Eriphia gonagra M. Edw.; Hist. Nat. des Crust. i. 426. Dana, U. S. Expl. Exped. Crust. i. 250.

Found at the Tortugas by Capt. Woodbury and others; at Aspinwall and at Panama by the Rev. J. Rowell.

We cannot distinguish the Panama specimens from those found on the east side of the isthmus.

A variety (?) is found at Key Biscayne, at the Tortugas, and at Aspinwall, in which the chelipeds are much more tuberculated than in the typical forms, there being strong tubercles on the carpus and on the lower half of the outer side of the hand.

Dr. Cooper makes an interesting statement with regard to the habits of this species:—that they build nests of mud upon the branches and roots of the mangrove at the edge of the water, into which they retire for concealment. The old world species, observed by myself (*E. Smithii*, *levimana*, *spinifrons*, *etc.*), hide in small cavities of the rocks, from which it is extremely difficult to extract them uninjured.

Eriphia squamata.

Eriphia squamata Stimpson; Ann. Lyc. Nat. Hist. N. Y., vii. 56.

This species is further distinguished from *E. gonagra* by having generally one or two more spiniform teeth on the antero-lateral margin. It has been received from the following additional localities, viz.: Cape St. Lucas, J. Xantus; Panama, Rev. J. Rowell; Peru, C. H. Raymond.

Eriphia hispida, nov. sp.

Body and feet everywhere covered above with short, stiff, black setæ, mostly arising from tubercles. Carapax rather flattened above, indistinctly areolated, rugose with low tubercles, from the front edges of which the setæ arise. Antero-lateral margin with about eight small teeth mostly armed with one or two denticles near their tips. Front broad, short-spinous; spines numerous, small, with obtuse tips. Orbit removed from the antennæ to a much greater distance than is usual in the genus;—its margin spinous, especially beneath, where there is a deep open fissure or hiatus near the external angle. Meros-joint of external maxillipeds with a slight sinus or emargination of its anterior margin near the summit, corresponding to the efferent aperture; ischium denticulated on its inner margin. Chelipeds unequal; hands tuberculated and granulated on both sides, the granules often crowding upon the tubercles; fingers in smaller hand spoon-excavated. Ambulatory feet short and stout, mostly smooth beneath the hispid covering; meros crenulated above; dactyle very short. Color purplish beneath the black setæ. Length of carapax in a female, 1.72; breadth, 2.35 inch.

Found on the west coast of Central America, by Captain J. M. Dow.

Domecia hispida.

Domecia hispida Soul., Voy. au Pole sud, pl. vi., f. 3, 7.

We have specimens, found at St. Thomas by Mr. Riise, which are of this species, or of one so closely allied, that the published figures do not enable us to distinguish it.

Trapezia maculata.

Trapezia maculata Dana, U. S. Expl. Exped. Crust. i. 256, pl. xv. f. 4.

Mr. Xantus has sent a specimen of this species, collected at the Island of Socoro, off the west coast of Mexico. It was originally found at the Sandwich Islands, and is one of the very few species common to the American coast and the eastern outskirts of the great Indo-Pacific region.

Trapezia nigro-fusca, nov. sp.

Carapax broad, naked, slightly convex, very smooth and glabrous, with a few scattered punctæ surrounding the gastric region, though scarcely defining it. A very slight marginal tooth on either side, at the usual position. Front slightly convex, entire, not denticulated. Outer maxillipeds fitting neatly in the buccal area, and not gaping; basal margins in a transverse line. Chelipeds with the meros short, as in *Tetralia;* carpus almost bilobate within; hand very broad and depressed. Ambulatory feet short, naked; dactyli with obtuse unguiculi sufficiently conspicuous, bent inward at an angle with the main part of this terminal joint. Color uniform dark-brown, almost black. Length of carapax in a male, 0.37; breadth, 0.46 inch.

Cape St. Lucas. J. Xantus.

Neptunus.

This genus was instituted by De Haan for a small group of *Lupae*, species mostly pelagic in their habits, as *L. pelagica* and *L. sanguinolenta*, which are the two mentioned by that author as examples. It has been rejected by succeeding carcinologists, and re-united to *Lupa;* but I believe it to be well characterized by the great breadth of the carapax, the little-prominent front, the short meros-joint of the outer maxillipeds, which is not produced beyond the base of the palpus, and is obtuse at its outer angle, and by the broad, lamelliform dactyles of the first three pairs of ambulatory feet.

In the dismemberment of the genus *Lupa*, the old name should strictly have been retained for this group called *Neptunus* by De Haan. But as that author had a right to restrict the name as he did, to *Lupa forceps*, it can scarcely now be changed.

Neptunus sayi.

Lupa pelagica Say, Jour. Acad. Nat. Sci. Philad. i. 97.
Lupa sayi Gibbes, Proc. Am. Assoc. 1850, p. 178.

Found among floating sargassum in the North Atlantic Ocean, and not unfrequently washed ashore in considerable numbers on the Florida Reefs.

Callinectes.*

Under this generic name we propose to distinguish the common American *Lupa diacantha.* It cannot be placed in any group yet indicated without violence to its characters. With the broad carapax, low front, and general habit of *Neptunus*, the genus now proposed is quite distinct in its external maxillipeds, the meros-joint of which, though short, is sharply prominent and curved outward at its antero-external angle. Also, the male abdomen in the narrowness of its terminal half, has a form found in no other genus of Lupidae, except perhaps *Euctenota* Gerst., a genus characterized by its narrow front and dentated orbits.

Callinectes diacanthus.

Lupa diacantha (Latr.) M. Edw.; Hist. Nat. des Crust. i. 451.

We have been unable to find constant differences between the northern and southern varieties of this species, which ranges from Cape Cod to Rio Janeiro. It is also found on the west coast of America, as we have received an unmistakable specimen from Mr. Xantus, collected at Cape St. Lucas. This circumstance throws a doubt upon the distinctness of *L. bellicosa*, described in our last number.

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* Καλὸς, strenuus; νήκτης, natator.

Acheloüs.

A genus founded by De Haan. He refers to it but one species, the *Portunus spinimanus* of Latreille. This species has been placed in *Lupa* by subsequent writers, but it appears to be quite distinct in its narrower and pubescent carapax, its anteriorly-produced meros-joint of the outer maxillipeds, and its narrow dactyli of the ambulatory feet. We have, therefore, found it necessary to retain the genus, and to place in it several species usually referred to *Amphitrite*, a heterogeneous group of De Haan's, in which he placed *L. gladiator*, *hastatoides*, *diacantha*, and, with a query, *cribraria*, *rubra*, and *pelagicus* of Bosc (*sayi* Gibbes). This genus can scarcely be retained, even were its name acceptable, which it is not, being pre-occupied.

The genus *Acheloüs*, as now constituted, is chiefly characterized by the shape of the meros-joint of the external maxillipeds, which is greatly produced anteriorly beyond the base of the palpus, with its outer margin usually straight, but sometimes a little projecting at the antero-exterior angle. The carapax varies considerably in width, and in the length of the lateral spine or posterior antero-lateral tooth. The terminal joints of the first three pairs of ambulatory feet are sulcated, and usually narrow, but sometimes rather broad and flattened, although never approaching so much as those of the true swimming Lupas.

All the American species (except *Lupa rubra*) usually referred to *Amphitrite* are here included. The East Indian

Amphitrites probably form a distinct genus, with their large eyes, prismatic hands, etc.; but this point we have not yet investigated.

Acheloüs gibbesii.

Lupa gibbesii Stimpson, An. Lyc. Nat. Hist. of N. Y., vii. 57.

An important distinctive character in this species, which we overlooked in the previous description, consists in the existence of one or two shallow oblong pits or little depressed spaces, with a smooth, iridescent surface, near the antero-lateral margin at the penult or antepenult marginal tooth. At least one of these pits is always present, and will always distinguish this species from the varieties of *A. spinimanus*, some of which approach it quite nearly, being similar in coloration. They are, also, almost always found together.

It is found as far north as Beaufort, N.C.

Acheloüs xantusii, nov. sp.

Carapax pubescent; front and antero-lateral margins meeting in an angle. Front four-toothed; teeth equally prominent; the two middle ones less broad and more acute than the outer ones, and separated from them by a wider space than from each other. Antero-lateral margin nine-toothed, including the angle of the orbit, which is prominent, protruding forward nearly as far as the frontal teeth; posterior tooth (or lateral spine) nearly three times as long as the one anterior to it. Eyes of moderate size, and in great part concealed by the orbit when retracted; cornea rather less thick than the peduncle. The entire lower margin of the orbit may be seen from above when the eyes are retracted. Meros-joint of external maxillipeds with the anterior extremity produced, rectangular. Chelipeds slender, pubescent; meros depressed, with the pubescence arranged on slight transverse ridges on the upper surface, and the anterior margin five- or four-spined; carpus and hand each two-spined. Ambulatory feet slender; dactyli of first three pairs rather narrower than in *A. spinimanus*, but similarly sulcate and ciliated. Length of carapax in a female, 0.54; breadth, 1.05 inch.

Very common on the beaches of Cape St. Lucas. J. Xantus.

Acheloüs tuberculatus, nov. sp.

Carapax inconspicuously pubescent, surface uneven, with the protuberant parts granulated. There are from four to six small tubercles on the gastric region, two on the cardiac, and two on the inner part of each branchial region. Front rather prominent, convex, four-toothed; teeth subequal, the median ones most projecting and more greatly separated from each other than from the lateral ones. Eyes of moderate size, with the cornea but little thicker than the peduncle. Antero-lateral margin nine-toothed, with the posterior tooth or spine very long, as long as the space occupied by the next five teeth in front of it. Posterior angle of the carapax armed with a hooked spine, directed upward and forward. Meros-joint of external maxillipeds rather less produced than usual. Chelipeds slender, with spines as in the preceding species; hand very slender. Dactyli of ambulatory feet as in *A. xantusii.* Length of the carapax in a female, 0.52; breadth, 1.20 inch.

Common at Cape St. Lucas. J. Xantus.

Acheloüs depressifrons.

Amphitrite depressifrons Stimpson, An. Lyc. Nat. Hist. N. Y., vii. 58.

We have received a large number of fine specimens of this species from the officers stationed at the Tortugas, Fla., which enable us to amend the specific character previously published, and to add further remarks. The largest of these specimens is an inch and a half in width. The carapax is pretty uniformly mottled and clouded with purplish-grey, but is lighter at the middle. There is always a dark median spot on the intestinal region. Front very little prominent. Hand remarkably short and compressed, with the spine of the superior margin situated near to the base of the dactylus, which is ciliated above with long reddish hairs; hinge-tubercle, and most of the teeth on the inner sides of the fingers, bright carmine. Dactyli of the first three pairs of ambulatory feet very broad and flat for the genus, but with the sulci not entirely obscured.

This species is easily distinguished by the shortness of its lateral spine or posterior tooth of the antero-lateral margin, which is no larger than that in front of it.

Acheloüs ordwayi, nov. sp.

Carapax pubescent, sparsely granulated toward the antero-lateral margins; granules acute and of a red color. Front very prominent, and rather narrow, with four very sharp and prominent teeth. Antero-lateral margin nine-toothed, the posterior tooth twice as long as the next before it. Meros-joint of the external maxillipeds more prominent at its antero-exterior angle than is usual in the genus. Chelipeds with long and sharp spines, in the usual positions; hand rather short, with the supero-exterior surface in parts smooth, bare of pubescence, and highly iridescent; fingers long and narrow, deeply sulcated. The dactyli of the first three pairs of ambulatory feet in this species are very long and slender, subcylindrical, much narrower than in any other known species of Portunidae, and deeply sulcated. Color of the crab, pale reddish or brownish, mottled; gastric region usually deep crimson. Length of the carapax in a female, 1.45; breadth, 2.235.

This cannot be the *Lupa sebae* of M. Edwards, as that author states that in his species the posterior feet are armed with a spine on the meros-joint as in *L. rubra*.

Key Biscayne, Fla., Wurdemann; Tortugas, Woodbury; St. Thomas, Riise.

We have named it after our friend Mr. Albert Ordway, of Cambridge, a rising carcinologist of much promise, who is, we learn, engaged upon a monograph of the Portunidæ.

Cronius,[*] nov. gen.

This genus is founded on the *Lupa rubra* of M. Edwards, which forms the connecting link between the old genus *Lupa*, and *Charybdis*. It is allied to *Charybdis* in the shape of the front, and the movable part of the external antenna is somewhat remote from the orbit; but the process from the basal joint of this antenna does not quite join the præorbital tooth; leaving a narrow chink through which the movable part might perhaps have access to the orbit. The basal joint of the antenna is also armed with a short sharp spine beneath the articulation of the movable joint. The antero-lateral margin is nine-toothed, but the teeth are unequal, showing an approach to *Thalamita*. Endostome as in allied genera. Meros-joint of the outer maxillipeds very little produced anteriorly; external angle rather prominent, projecting a little over the tip of the exognath. Dactyli of ambulatory feet narrow and sulcated. Abdomen of the male subtrianglar, sides a little concave.

Cronius ruber.

Lupa rubra (Lam'k.) M. Edwards, Hist. Nat. des Crust. i. 454.

This is one of the species common to both sides of the continent, specimens having been found at St. Thomas, by Mr. Riise, and at Panama, by Mr. Sternbergh.

Euphylax,[†] nov. gen.

Carapax transversus, ovalis, convexus; margine antero-laterali brevi, rotundato, parce dentato; regione faciei (inter angulos orbitarum externos), carapace vix quarta parte angustiore. Orbitae grandes, praelongae,

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[*] Κρόνιος, nomen Neptuni.

[†] Εὔ, bene, φύλαξ, vigil.

extus profundae; angulo externo sat prominente; lobo suborbitali valido, prominente, superficie laevi, margine crenulato. Oculi magni, pedunculis gracilibus valde elongatis, compressis; corneis sat validis. Frons inter bases oculorum perangusta, antice multo dilatata, margine undulata, breviter cristata. Antennae et antennulae eis *Podophthalmi* similes. Maxillipedes externi eis *Luparum* vix diversi, necnon mero oblique quadrato, vix longiore quam latiore, marginibus non incisis, angulo externo late rotundato. Chelipedes longi, manu forte compressa. Pedes postici toti natatorii; dactylis primi secundi tertiique paris late lanceolatis, quarti paris ovatis.

This very distinct and interesting new genus appears to be nearest allied to *Podophthalmus*, which it resembles in the characters of the front, antennæ, etc., and in the great development of the eye peduncles, which is the most striking feature. But the orbits are shorter than in that genus, and closed externally, well surrounding the eye-bulbs when retracted. The carapax also is very different in its rounded sides and want of spines. In fact the general form resembles more that of some *Lupidae*, while the character of the antero-lateral margin and feet recalls *Polybius*.

This is one of the very peculiar forms now so rapidly turning up from the west coast of America. But one species is yet known.

Euphylax dovii, nov. sp.

Pl. V. fig. 5.

Carapax transversely oval, one half broader than long, smooth and glabrous, but minutely punctate, unevenly convex; cardiac region more protuberant than the gastric. Antero-lateral margin much shorter than the postero-lateral, undulated and obscurely five-toothed, including the angle of the orbit, which is much larger and more prominent than either of the other teeth; posterior tooth minute, subspiniform; intermediate ones very minute, indistinct, and unequally distant. Margins of orbit crenulated. Suborbital lobe large and very prominent, with polished superior surface; distance between its anterior and posterior margins much exceeding width of eye-peduncle. Front nearly three times as wide at its anterior extremity as at its base between the eyes; with a supra-marginal crest interrupted at the middle. Inter-antennulary septum or median process from epistome, armed with a strong sharp tooth projecting forward. Chelipeds rather large, nearly smooth above; meros broad, armed with three or four very small spines anteriorly: carpus one-spined within, and with a crenulated outer margin indistinctly one-toothed; hands ornamented with slight longitudinal ridges sparsely granulated or short-spinulated, also with two or three elongated tubercles on inner side of palm, behind base of dactylus; fingers much compressed, not gaping, strongly toothed within, and with crenulated exterior margins. Color of alcoholic specimen purplish. Length of carapax in a female, 1.8; breadth, 2.8 inch.

Found on the western coast of Central America, by Captain J. M. Dow, of the Steamer "Guatemala," to whom we have dedicated the species.

CORYSTOIDEA.

Pliosoma, nov. gen.

Corpus rotundato-ovatum, longius quam latius, valde inflatum. Regio faciei valde angustata, tumida. Frons vix rostrata, rostro fisso. Oculi parvi, retractiles, longitudinaliter porrecti. Orbitae profundae, antrorsum directae, angulo externo prominentes; margine superiore unifisso. Antennae externae articulus basalis hiatum internum orbitae apte implens; pars mobilis mediocris, orbita exclusa, basi aperta. Antennulae in fossis. Epistoma brevissimum, fere obsoletum, apicibus maxillipedum tectum. Maxillipedes externi elongati, eis Maioideorum plus minusve similes, ischii apice interno antrorsum producto, palpo endarthroideo; exognatho magno, versus apicem contracto et dente intus armato. Chelipedes valde debiles, parvi. Pedes ambulatorii primi paris longiores, extremitate graciles, cylindrici; tertii quartique paris versus extremitatem compressi et ciliati; quarti paris dactylus lanceolatus fere natatorius. Sternum antice perlatum, retrorsum angustatum.

The single species upon which the genus above described is established, seems to belong to the *Corystoidea* rather than to any other tribe of Brachyua, notwithstanding the small development of the antennae, which are no larger than in many Maioids or Cancroids. The tribe named is by no means well constituted, and, as far as understood, it seems to rest upon general rather than particular characters. And, though our genus approximates to none of those hitherto referred to this tribe, yet in general habit, want of a distinct rostrum, epistome covered by the narrow outer maxillipeds, compressed posterior feet, etc., it shows so many of the characters found in different genera of Corystoids, that we have not hesitated to arrange it here.

Pliosoma parvifrons, nov. sp.

Pl. V. f. 6.

Carapax convex, pubescent; median regions well separated from the hepatic and branchial ones. Upper surface armed with erect blunt spines, as follows; four large and seven small ones on the gastric region, the large ones on its posterior part; one on the cardiac, and one on the intestinal region, curved forward; two on the inner part of the branchial, and two longer ones on the anterior part of its lateral margin; three small ones on the hepatic region. There is also a spine on the middle of the pterygostomian ridge. The facial region occupies less than one-third the width of the carapax. Distance between the bases of the chelipeds about one-half the width of the carapax. First pair of ambulatory feet in the male about one and one-half times the length of the carapax. Color brownish or buff. Length of the carapax in a male, 0.61; breadth, excluding spines, 0.53; in a female, length, 0.81; breadth, 0.7 inch.

It was found in great abundance at Cape St. Lucas, by Mr. Xantus.

OCYPODOIDEA.

Gelasimus brevifrons, nov. sp.

A large species, allied to *G. palustris*, but the carapax is more convex and less narrowed behind, with the H-shaped impression in the middle deeper; the front very short, broad and more rounded; and the anterior superciliary margin more convex and projecting from the posterior one. On the inner side of the greater hand, the inferior oblique crest is much more prominent, while the superior one is nearly obsolete. Length of the carapax, 0.72; breadth, 1.07 inch.

Found in a lagoon at Todos Santos, near Cape St. Lucas, Lower California, by Mr. Xantus.

Ocypoda occidentalis, nov. sp.

Of the same size, and not easily distinguishable from the common *O. arenaria* of the eastern coast. But the ambulatory feet are less pilose, and the pubescence upon them is much shorter. The gastric region is more coarsely granulated. These being constant differences, observed in a large number of specimens, we have ventured to consider the western form specifically distinct.

Found in considerable numbers at Cape St. Lucas, by Mr. Xantus. Mr. X. gives an amusing account of his method of taking these crabs. His small dog finds their holes and digs them out, bringing them uninjured to the feet of his master.

Grapsus macúlatus.

Grapsus maculatus (Catesby), M. Edw., Mel. Carcin. p. 132, pl. vi. f. 1.
Grapsus pictus Latr., Gibbes, etc.

Found at the Tortugas by Messrs. Wurdemann and Whitehurst, and is not uncommon on other parts of the Florida coast.

Grapsus altifrons, nov. sp.

Grapsus pictus Sauss., Rev. et Mag. de Zoölogie, v. 362. (non Latr.)

A large species intermediate between *G. maculatus* and *G. ornatus*, having the projecting front-margin, the narrow cardiac region, the circumscribed yellow spots on the carapax, and the robust feet of the latter, with the short blunt internal suborbital lobe of the former. The sides are more strongly arcuated than in any other species of the genus. The front is perpendicular, very high, with a concave surface, and a very prominent superior margin, the frontal lobules projecting forwards slightly beyond the inferior margin.

We have no specimens of the Chilian species, *G. ornatus*, for comparison with ours, but if M. Edwards' short description is correct, that species is quite distinct in its long, acute internal suborbital lobe, projecting beyond the frontal margin.

G. altifrons is found in great numbers on the rocks of Cape St. Lucas, by Mr. Xantus.

Geograpsus lividus.

Grapsus lividus M. Edw., Hist. Nat. des Crust. ii. 85; Mel. Carcin. 135.

The meros-joint of the ambulatory feet in this species is somewhat denticulated at the inferior extremity, and not completely unarmed as stated in the descriptions.

Found at the Tortugas by Dr. Whitehurst. Specimens have also been found at Cape St. Lucas, by Mr. Xantus, which we have referred to this species, although they are darker in color than West Indian examples, being more closely reticulated with purplish. Should they prove distinct, we propose to call the species *G. occidentalis*.

The crab under consideration has been found by Mr. Xantus and other observers at low water, on the rocks of the sea-shore. On establishing the name *Geograpsus* for the group (Proc. Acad. Nat. Sci. Philad. April, 1858), our impression was that they were terrestrial in their habits, as the only species we had observed living (*G. rubidus*) was found in ravines nearly a mile from the sea. But from what we hear of *G. lividus*, we now infer that either the habits of the different species differ, or that they visit the land only at certain periods of the year,—perhaps at the breeding season.

An additional character for the genus is found in the non-excavated fingers of the large chelipeds.

Nautilograpsus minutus.

Nautilograpsus minutus M. Edw., Hist. Nat. des Crust. ii. 90.

Found at Cape St. Lucas, by Mr. Xantus. We are unable to distinguish the specimens from those collected from Gulf-weed in the North Atlantic.

Plagusia orientalis.

Plagusia squamosa M. Edw., Mel. Carcin. p. 144.
Plagusia orientalis Stm., Proc. Acad. Nat. Sci. Philad., April, 1858.
Prodromus etc. p. 49.

We have received from Mr. Xantus several specimens of a *Plagusia* from Cape St. Lucas, which we cannot distinguish from the common E. Indian species usually called *P. squamosa*, but which is not the true *Cancer squamosus* of Herbst, as may be seen from his figure. It is distinguished from the Atlantic species by the non-dentate superior lobe of the ischium-joint in the ambulatory feet, and by the septem-dentate margin of the epistome.

Plagusia depressa.

Plagusia depressa (Fabr.) Latr.; M. Edw., Hist. Nat. des Crust. ii. 93.

Found on the west coast of Central America, by Capt. Dow. It properly belongs to the Indo-Pacific fauna.

Acanthopus planissimus.

Cancer planissimus Herbst.
Plagusia clavimana Auct.; Gibbes, Proc. Am. Assoc. 1850, p. 180.
Acanthopus planissimus Dana.

Found at Key Biscayne, Fla., by Mr. Wurdemann, and at Cape St. Lucas, by Mr. Xantus.

Milne Edwards separates the West Indian *Acanthopus* from *A. planissimus*, under the name of *A. gibbesii* (Mel. Carcin. p. 146). They may be distinct, but we do not find the differences mentioned by that author to be constant.

We have but one specimen from Cape St. Lucas, in which the antero-lateral margin is slightly concave anteriorly. It may therefore belong to a distinct species from *A. planissimus*, but we do not venture to decide upon this question until the arrival of additional specimens which may enable us to observe whether the character be constant.

Aratus pisoni.

Sesarma pisoni M. Edw., Hist. Nat. des Crust. ii. 76; pl. xvii. f. 4, 5.
" Gibbes, Proc. Am. Assoc. 1850, p. 181.
Aratus pisoni M. Edw., Mel. Carcin. 153.

Found at Key Biscayne, by Mr. Wurdemann, at the Tortugas, by Capt. Woodbury, and at Charlotte Harbor, West Fla., by Mr. E. B. Baker. The last-named gentleman informs me that this species lives much on land, and climbs trees, even to their tops, where they are often found. They run with rapidity and are difficult to secure.

Gecarcinus ruricola.

Gecarcinus ruricola Latr.

Found at Key Biscayne, by Mr. Wurdemann, and at Hayti, by Dr. Weinland. The Florida specimen is narrower and more convex than that from Hayti.

Gecarcinus quadratus.

Gecarcinus quadratus Sauss., Rev. et Mag. de Zool., 1853, v. 360. pl. xii. f. 2.

A specimen was found at Cape St. Lucas, by Mr. Xantus. It does not agree exactly with M. de Saussure's description and figure, as the lateral carina of the dactylus of the ambulatory feet is less spinous, approaching in character that of *G. lateralis.* The meros-joint of the external maxillipeds is short, and entire anteriorly, but not produced forward as in *G. ruricola.*

Gecarcinus lateralis.

Gecarcinus lateralis Guerin.

The terms of Milne Edwards' description of this species are not always strictly correct, for the meros-joint of the external maxillipeds has often a slight notch or concavity on the anterior margin. Also, the dactylus of the ambulatory feet has sometimes a few spines on the lateral carinæ toward the extremity.

Found at Key Biscayne, by Mr. Wurdemann, and at the Tortugas, by Capt. Wright.

Gecarcinus planatus, nov. sp.

Body depressed; carapax broad, flattened about the middle and posteriorly; median and lateral furrows of gastric region well-marked, the median one deep; longitudinal furrows of branchial region near gastric, obsolete; transverse cardiac furrow deep; no furrow separating genital region from the gastric. Hepatic, and anterior part of gastric regions granulated. Frontal margin thin and denticulated; not dilated within to the antennulary fossae. Meros-joint of outer maxillipeds subquadrate, with a very deep notch on its antero-interior margin. Chelipeds rather small; carpus armed with small spines on the inner margin. Ambulatory feet of moderate length, very spinous toward their extremities; dactylus with six rows of spines. Length of carapax in a male, 1.37; breadth, 1.80 inch.

Found at Todos Santos, near Cape St. Lucas, Lower California, by Mr. John Xantus.

Epilobocera,* nov. gen.

Potamocarcino carapacem frontemque similis. Lobus suborbitalis internus fronti junctus, antennam externam tegens, sed non eam orbita excludens. Antennae pars mobilis parvus, in orbitae cantho interno situs. Maxillipedum externorum merus transversus, margine antico rotundatus; palpus goniarthroideus.

Though closely allied to *Potamocarcinus*, this genus is very peculiar in the position of its external antenna, which passes behind the internal suborbital lobe and enters the orbit, the moveable part appearing in the interior corner of that cavity.

Epilobocera cubensis, nov. sp.

Carapax flattened, glabrous; dorsal surface minutely granulated, with two minute lunate sutures or impressed lines at the middle; antero-lateral margin with sixteen small teeth; superior frontal crest crenulated, and not projecting beyond the inferior one. Chelipeds rather long; meros with spinous edges; carpus with a large spine within; fingers slender, not gaping, much longer than the palm. Ambulatory feet nearly smooth, naked; dactyli with three rows of spines above and two below, spines few in the lower rows. Length of carapax in the male 1.34; breadth, 2.14 inch.

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* 'Επὶ, super; *λοβὸς*, lobus; *κέρας*, cornu.

Found in fresh-water streams on the Island of Cuba, near Santiago, by Mr. Charles Wright.

Pinnixa cylindrica.

Pinnotheres cylindricum Say, Jour. Acad. Nat. Sci. Philad. i. 452.
Pinnixa cylindrica White, Cat. Brit. Mus. Crust. 1847, p. 33.
Pinnixa laevigata Stimpson, Ann. Lyc. Nat. Hist. N. Y., vii. 22.

Upon further study of the American species of *Pinnixa*, we find that the true *cylindrica* of Say is the species we described in the last number of these "Notes" under the name of *laevigata*, while the species we there considered as the *cylindrica* is a new species, which we describe below under the name of *P. chaetopterana*.

This species is found as far north as Beaufort, North Carolina.

Pinnixa chaetopterana, nov. sp.

Pinnixa cylindrica Stimpson, Ann. Lyc. Nat. Hist. N. Y., vii. 22.

Carapax very broad, thickly hairy about the sides; surface uneven. There is a very acute transverse crest on the cardiac region, broadly interrupted at the middle, forming two prominent dentiform protuberances. Regions well defined by pubescent sulci. Front narrow, with a deep median groove; margin deflected at the middle to form the interantennulary septum, so that the front, seen from below, forms two arches. Hepatic region broadly expanded, rather depressed in front, but marked by no ridges. Chelipeds robust. Hand large in the male; palmar edge perpendicular; fingers strongly gaping; pollex very short, but acutely prominent and curved, with a tooth on its inner margin next the base of the dactylus; dactylus strongly hooked, smooth on both margins. In the female, fingers much compressed, not gaping, broad and oblique; pollex nearly as long as the dactylus, and armed with a tooth on the middle of its inner margin. Ambulatory feet stout, hairy, with a very short dactylus. Feet of the penult pair very much longer and stouter than the others, with a transverse groove next the summit of the meros; carpus and penult joint crested above; inferior margin of meros and penult joint denticulated; inferior surface thickly pubescent. Length of the carapax in a male at the middle, 0.19; breadth, 0.51 inch. Females are generally larger.

Found in the tubes of *Chaetopterus pergamentaceus*, on the muddy or clayey shores of Charleston Harbor, S. C.

Pinnixa sayana, nov. sp.

Carapax smooth, glabrous, depressed at the middle, and with a slight sharp transverse ridge parallel with and near to the posterior margin, not interrupted at the middle. Two similar ridges on the antero-lateral slope, distant but nearly parallel with each other, the superior one curving inward and defining the branchial region. External antennae about one-third the length of the carapax. Hands robust, compressed, scarce twice as long as broad, smooth, and of the monodactyle kind, the pollex being very short; dactylus curved to a right angle. No teeth on these fingers. Ambulatory feet smooth, rather slender, with dactyli rather long; penult pair larger than the others, but proportionally much less robust than in other species of the genus. Length of carapax in a male, 0.125; breadth, 0.24 inch.

This species approaches nearer to *P. monodactylus* Say, than any other species yet described, but it does not have the long antennæ and the teeth at the base of the fingers mentioned in Say's description. The carapax in our species is nearly as in *P. cylindrica*, but the chelipeds are like those of *P. chaetopterana*.

Dredged in six fathoms, sandy mud, off the mouth of Beaufort Harbor, N.C.

CALAPPOIDEA.

Calappa xantusiana, nov. sp.

Allied to *C. marmorata* in its little protruded front and in the character of the surface. It is, however, much narrower and more convex than that species, and the triangular teeth of the postero-lateral margins are carinated along the middle above, somewhat as in *C. gallus*, but more obliquely. Also, there are numerous short transverse crenulated carinae or ridges on the surface near the posterior margin. The upper surface is elsewhere naked and glabrous, although depresso-papillose and crowdedly granulated, the granules appearing as if covered with a kind of glazing which fills up their interstices. The frontal sinuated margin and teeth are obtuse, and there is no median denticle. The superior crests of the hands are six-toothed, the teeth being less acute and smoother, or more regularly crowdedly granulated than in *C. marmorata*. Length of carapax in a male, 1.15; greatest breadth (posteriorly), 1.46 inch.

Found at Cape St. Lucas by Mr. John Xantus.

Cyclois bairdii, nov. sp.

Carapax broader than long, regularly convex; surface more even than in *C. cristata*, but with the median regions sufficiently well defined. Young specimens are, however, more uneven, and sometimes tuberculated. Front tridentate. Antero-lateral margin minutely toothed; every third or fourth tooth being larger than the others; posterior tooth larger than the rest, but not projecting beyond the level of the convex portion of the lateral margin where the carapax is broadest. External crest of meros-joint in the chelipeds granulated, bidentate;—a short crest on the base of the hand is continuous with it, and terminates anteriorly in a tooth. Hand on the outer surface granulated, and very sparsely low-tuberculated, with two or three longitudinal crests armed with larger granules, near the base; inferior margin denticulated; superior crest eight-toothed. Ambulatory feet as usual in the genus. Length of carapax in a male, 1.57; breadth, 1.68 inch. In young individuals the length and breadth are equal.

It differs from *C. granulosa* De H. in its broader carapax, and in having teeth on the exterior margin of the crest of the meros and hand in the chelipeds. These teeth are not spiniform as in *C. cristata* (*s. dentata*) Brullé.

Found in great abundance at Cape St. Lucas, by Mr. Xantus.

LEUCOSOIDEA.

Lithadia cariosa, nov. sp.

Body and feet everywhere tuberculated or granulated above and below. Carapax convex, subrhomboidal, with the anterior and posterior angles truncated, and the lateral angles obtuse, but not at all truncated. A small tooth on the postero-lateral margin, separated by a deep sinus from the posterior extremity or intestinal region, which is bilobate. The hepatic region projects scarcely at all beyond the antero-lateral margin, but is seen in a side view to project beneath, forming a triangular tooth on the inferior surface. On the upper surface, the cardiac, and the inner lobules of the branchial region are strongly protuberant. The front is also prominently elevated, and connected with the middle protuberances of the carapax by a narrow longitudinal ridge traversing the gastric region, which ridge, together with the frontal region, is much smoother than the rest of the surface. On either side of this ridge there is a deep and rather broad excavation of a darker color than the protuberant parts, which extends laterally over the anterior part of the branchial region, but is nearly divided in two by the slightly prominent hepatic region, which projects inward from the antero-lateral margin, with an arcuated inner edge armed with prominent granules. There is also a deep sulcus of the same character, but very narrow, separating the cardiac from the branchial regions, and passing behind the former region, separating it from the thick intestinal lobes. A slight shallow depression on the branchial region, along the postero-lateral margin. On the protuberant middle and posterior parts of the carapax the granules are very large, and somewhat irregularly piled upon each other, leaving upon the cardiac numerous small eroded cavities. There is also a little pit on each of the median protuberances. The front is strongly prominent, with a concave margin fissured at the middle. The orbits are small, opening above so that the eyes may be seen. External maxillipeds granulated, most strongly so near the extremities, where the acute tips of the endognaths project considerably beyond the obtuse extremities of the exognaths. Chelipeds of moderate size, somewhat depressed; meros broader than the hand, with its outer margin convex and a little irregular, but not prominently tuberculated as in *L. cumingii;* hands rather small, uniformly granulated above and below, and tapering to rather slender fingers. Ambulatory feet cylindrical, covered with small granules, which upon the dactyli become very minute, crowded, and almost spinuliform. Sternum and abdomen covered with small, hard, smooth tubercles, and ornamented with seven or eight red dots. Abdomen armed with a backward-pointing tooth at the extremity of the penult joint. Length of carapax in a male, 0.42; breadth, 0.430 inch.

The genus was founded by Bell for a Central American species, *L. cumingii*, the only one hitherto known, from which ours differs in its less prominent marginal teeth of the carapax.

L. cariosa was dredged on a bottom of somewhat indurated ferruginous sand, in two fathoms, in one of the channels of the harbor of Beaufort, N.C.

DROMIOIDEA.

Dynomene ursula, nov. sp.

The whole upper surface is covered with stout thick setae of two kinds;—the first kind very short, clavate, or even pedicellate, and densely crowded,—the second long (a tenth of an inch), and nearly as thick as the first, but fusiform, with pointed extremities, and sparsely distributed over the surface, generally in groups of three or four, of unequal lengths. Surface of the carapax beneath the setae crowdedly granulated; granules, however, not prominent; sulci defining the areolets not deep. Antero-lateral margin longer than the postero-lateral, regularly curved, not sinuated as in *D. hispida*, and armed with five small spines, not including that at the angle of the orbit. Front low-triangular; margin somewhat arched, and continuous with the superior margin of the orbit, which forms a low projection opposite the juncture of the cornea of the eye with its peduncle. In other characters this species bears great resemblance to *D. hispida*, except that the dactyli of the ambulatory feet are setose like the other joints, and have sharp, black, much-curved unguicles. The color is more or less reddish or crimson; setae of a light golden color. Length of carapax in a female, 0.5; breadth, 0.6 inch. Males are somewhat smaller.

This is an interesting addition to a genus, the species of which are very few and rarely seen. In this genus the first three pairs of ambulatory feet are alike, the third pair not being reduced in size, as in *Dromia*, but rather larger than smaller than the second pair. Those of the last pair are very small and weak, but not prehensile, since the animal does not cover itself with a foreign body like the *Dromiae;* and they fill, apparently, no office in the economy of the animal, except that when in place, they fill up neatly the chink between the carapax and the stouter walking feet.

D. ursula was found at Cape St. Lucas by Mr. Xantus.

RANINOIDEA.

Ranilia angustata, nov. sp.

Very closely allied to *R. muricata*, but with the carapax conspicuously narrower, smoother, and more glabrous. Colors: carapax pale-red in alcoholic specimens, closely maculated with white, the spots being generally about one-fifteenth of an inch in diameter, but sometimes larger, and so much crowded, that the carapax appears white, reticulated with red. Length of carapax in a male, 0.93; breadth, 0.66 inch.

Found at Cape St. Lucas by Mr. Xantus.

HIPPOIDEA.

Remipes pacificus.

Remipes pacificus Dana, U. S. Expl. Exped., Crust. i. 407, pl. xxv. f. 7.

Taken by Mr. Xantus at Cape St. Lucas. It was originally found at the Sandwich Islands.

Remipes strigillatus, nov. sp.

Body much depressed, broad. Front very broad, undulated, with an obtuse projecting point at the middle; margin entire, smooth. Sides toward the margin obliquely striated, the striated area being very broad, especially posteriorly, where it occupies on each side one-fourth the width of the carapax; striae sharp, minutely setose, and not interrupted, but extending quite to the margin. Antennulae robust; last joint of the peduncle nearly as broad as the penult. First pair of feet in the adult short, robust; terminal joint nearly half as broad as long; extremity blunt, with short setae, and with two strong, oblique, setose ridges on the extero-inferior side. Length of carapax in a female, 1.0; breadth, 0.83 inch.

Very different from all known species in its entire front and broad lateral striated areas.

Cape St. Lucas. J. Xantus.

Lepidops myops, nov. sp.

Carapax with the same markings on the surface as in *L. scutellata*, but stronger. Post-frontal transverse groove broad, with granulated surface. Median lobe of front rounded; margin armed with small teeth like those of a comb, which become more conspicuous outwardly as far as the lateral lobes, where the margin becomes smooth. Ocular plates or scales obliquely oblong, rather thick, broader behind; antero-exterior angle prominent, subacute; inner angle rounded; eye-specks obsolete in most of our specimens, in others barely visible on the inferior side of the ocular plate near the exterior angle. In other characters this species approaches very near to *L. scutellata.* Length of carapax in a female, 0.41; breadth, 0.47 inch.

Cape St. Lucas. J. Xantus.

LITHODOIDEA.

Dermaturus hispidus, nov. sp.

Body depressed. Carapax moderately convex anteriorly, posteriorly flattened, and even. A depression at the anterior extremity of the branchial region. Cardiac transverse sulcus deep. Surface uniformly and thickly covered with very small setose tubercles or short spines. Lateral margins well defined but not at all projecting, and armed with spines a little longer than the rest. The latero-inferior or epimeral surface may be seen in a view from above, at the branchial regions. Rostrum rather large, prominent, tumid, reaching to the tips of the eyes, with a tri-spinose apex. Eye-peduncles hispid. In the external antennae both the acicle and the process at its base are armed with three or four spines, flexible in our specimen. The whole arrangement of the eyes and antennae shows more similarity to the Lithodina than to the Hapalogastrina. External maxillipeds of moderate size; ischium projecting within with a denticulated margin; last two joints subcylindrical, not dilated. Feet thickly beset with setose spines, longest on the margins, and more or less clothed with long hairs. Chelipeds not longer than the ambulatory feet; carpus and meros armed with two or three long spines within; fingers not gaping, and with cochleariform, black, corneous apices. Ambulatory feet not flattened; middle pairs one and two-thirds as long as the carapax. Abdomen hispid like the carapax, but more minutely; plates of the basal joint broad; right margin armed with a single close series of soft spines setose on their sides. Length of carapax in a female, 0.85; breadth anteriorly, 0.43; breadth posteriorly, 0.90 inch.

In habit, this species has a general resemblance to *Phyllolithodes*, and differs much from *Hapalogaster*. It may be necessary to separate it generically from *Dermaturus*, but we have not seen the typical species of this genus of Brandt.

It was taken from the stomachs of fishes caught off Monterey, California, by Alex. S. Taylor, Esq.

Hapalogaster inermis, nov. sp.

Carapax longer than broad, smooth above except where some minute, transverse, setose scabrosities or minute squamae are sparsely distributed, occurring most abundantly toward the sides. Margins unarmed, smooth. No sinus at the juncture of the cervical suture with the lateral margin. Rostrum convex above, almost carinated; apex scarcely acute. Inner orbital tooth minute, inconspicuous. Outer orbital tooth (antero-exterior angle of the carapax) far less prominent than the rostrum. Acicle rather short and broad, irregularly somewhat dentated along the exterior margin. Feet subcylindrical, almost naked, rugose above with minute and somewhat setose tubercles; dactylus three-fourths as long as the penult joint and armed with a long unguiculus. Plates of the first joint of the abdomen narrow. Length of carapax, 0.4; breadth posteriorly, 0.38 inch.

Puget Sound.

PAGUROIDEA.

Eupagurus annulipes, nov. sp.

Carapax rather depressed, smooth, naked above. Eyes nearly as long as the front is broad, and nearly reaching the tips of the peduncles of the antennae; they are somewhat constricted about the middle, and the cornea is not dilated. External antennae longer than the carapax, but not reaching the tips of the ambulatory feet; flagella sparsely clothed with long hairs. Feet pilose above, and of a pale orange color, annulated with dark purple; four or five rings on each ambulatory foot. Right cheliped very long, moderately and evenly granulated or scabrous above; carpus nearly twice as long as broad, and as long as the palm of the hand, spinulose along the inner margin; hand large, oblong-ovate, with long palm and short slender fingers. Beneath, the carpus and hand are convex, naked, and obsoletely granulated. Left cheliped very small, scarce over-reaching the extremity of the carpus of the right one, slender, rather compressed, spinulose and hairy above; hand rather smaller and shorter than the carpus; fingers somewhat longer than the palm and slightly gaping. Ambulatory feet slender, compressed; those of the right side as long as the right cheliped; a small spine at the extremity of the carpus joint; dactylus much curved, a little longer than the penult joint, scarcely twisted, with smooth, unarmed, sparsely pilose margins. Usual length about an inch. Length of carapax, 0.19; breadth of front, 0.11; length of greater cheliped, 0.52; of carpus and hand together, 0.34 inch.

It is allied to *E. brevidactylus*, but has the right cheliped much more elongated and less prominently granulated above. Also, the dactyli of the ambulatory feet are rather longer.

It is common in small univalves dredged in Beaufort Harbor, N. C., and off the coast adjacent, in from two to eight fathoms on bottoms of shelly sand.

GALATHEOIDEA.

Munida caribaea, nov. sp.

The species of *Munida* have all great resemblance to each other, and the present species forms no exception to this rule. It has the usual characters of front, spinous gastric and hepatic regions, etc. The particulars in which it differs from other species are the following. The rather convex carapax is more narrowed anteriorly. The anterior two-thirds of the lateral margin is armed with six or seven equal and equidistant spines. Eye-peduncles longer, and cornea less dilated than usual. Chelipeds very long, cylindrical, uniformly scabrous; and armed with very few spines sparsely scattered. Length of the carapax, 0.28; breadth, 0.16; length of cheliped, 0.77 inch.

It is the first species of the genus which has occurred upon the American shores. No true *Galathea* is found in the waters of the New World, notwithstanding the abundance of species and individuals in the Old.

Pleuroncodes, nov. gen.

We propose this new genus for the reception of the *Galathea monodon* of Milne Edwards, described in the "Histoire Naturelle des Crustacés," vol. ii. p. 276, and figured in the "Annales des Sciences Naturelles," Zool., t. xvi. pl. xi. f. 6. It is closely allied to *Munida* in the characters of the front, etc., but the sides or latero-inferior regions are greatly swollen, so that the epimeral sutures are seen from above. The insertion of the external antennae is also plainly seen from above, and not concealed beneath the antero-lateral angle of the carapax as in *Munida.* In the external maxillipeds the meros is unarmed, and the penult joint is slightly dilated, though much less so than in *Grimothea.*

Pleuroncodes planipes, nov. sp.

Very close to *P. monodon*, but with the ambulatory feet longer and more flattened than is represented in the figure of that species published by Milne Edwards. The penult joint of the ambulatory feet in our species is particularly flattened, and ciliated:—the upper surface is smooth except at the raised, granulated margins, and a slight obtuse median ridge. Length of carapax in a male, rostrum included, 0.95; greatest breadth, 0.54; length of cheliped, 1.90 inch.

It may prove identical with *P. monodon.* We have no opportunity of comparing specimens.

This species lives in the open ocean, and is sometimes found in vast quantities in the Pacific off the American Coast. It was taken by Mr. Grayson in N. lat. 24°, W. long. 130°. In March, 1859, it was thrown ashore in considerable numbers at Monterey, California, from which place specimens were forwarded to us by Alex. S. Taylor, Esq.

LIST OF FIGURES.

Plate II.

Fig. 1. *Anaptychus cornutus* ♂ nat. size.
" 1*a*. External antenna and orbit of the same, from beneath.
" 1*b*. External maxilliped of the same.
" 2. *Teleophrys cristulipes* ♂ twice natural size.
" 3. *Eucinetops lucasii*, the male specimen referred to on p. 192, twice natural size.
" 4. *Collodes granosus* ♀ natural size.
" 5. *Podochela grossipes* ♂ nat. size.
" 6. *Podochela riisei* ♀ nat. size.

Plate V.

Fig. 1. *Mimulus foliatus* ♂ nat. size.
" 2. *Xantho bella* ♂ nat. size.
" 3. *Xanthodes taylori* ♀ nat. size.
" 4. *Metopocarcinus truncatus* ♂ twice nat. size.
" 5. *Euphylax dovii*, frontal region, nat. size.
" 5*a*. Outer maxilliped of the same.
" 6. *Pliosoma parvifrons*, nat. size.

XXIII.—*Notes on some Cuban Birds, with Descriptions of New Species.*

By George N. Lawrence.

Read May 21, 1860.

I have received at different times from the collections of Dr. J. Gundlach and Ramon M. Forns, Esq., specimens of Cuban birds for examination, and of such as have been thought identical with species found in the United States for comparison with them. The result has been, that some have proved to be different from the species, under the names of which they have heretofore passed, and appear to be undescribed.

In the following notes descriptions are given of those I consider new, with observations on other species, which may serve to elucidate their history and correct some errors of nomenclature.

1. Tinnunculus sparveroides, (Vigors.)

Falco dominicensis, Gm.? Syst. Nat. 1789, p. 285.
" *sparveroides*, Vigors, Zool. Jour. 1827, iii. p. 436; D'Orbig. (R. de la Sagra) Hist. Cub. 1840, p. 30, pl. 1.
" *sparverius*, Lemb. Av. Isl. Cub. 1850, p. 128.
Tinnunculus dominicensis, Cab. Jour. f. Orn. Nov. 1854.
" *sparveroides*, Strick. Orn. Syn. 1855, p. 100 (sub. *T. sparverius*).
Hypotriorchis ferrugineus, Sauss.? Rev. et Mag. Zool. 1859, p. 117, pl. 3.

It being questioned by many writers whether the subject of this article is really distinct from *sparverius*, I am induced by the large number of examples sent me for the purpose, to point out such differences as appear of importance in determining whether they shall be entitled to specific distinction.

The following extract from a letter written by Dr. Gundlach gives some valuable facts:

> "In your letter of the 15th Aug., 1857, you allow that our bird (Sparrowhawk) is different, and you add, 'it is of course *sparveroides*, Vig., but whether *Dominicensis* is uncertain.' I am convinced that the species of St. Domingo is the same, for Mr. Saussure has described the dark female with the name of *ferrugineus*, see Rev. et Mag. de Zoologie de Guerin, 1859, No. 3, 117. I read in the Pacif. R. R. Reports, p. 14, 'younger male, upper parts as above, wing-coverts and tail ferruginous and with numerous transverse bands of brownish black,' etc. It seems strange that Mr. Cassin is not aware of the sexual difference, for always, even from the nest, the male has only one transverse band on the tail, and the female has several; the male has always the wing-coverts blue, and the female has them ferruginous, with transverse blackish bands. The only difference from age is, that the young have more spots on the upper and lower parts, and the adults have none. The varieties in color are not caused by age, they exist from the very first time the birds are fledged, and very often may be seen a very clear bird matched with a dark one. As this species is so common in Cuba, and perpetually resident, it seems strange that Mr. Gosse does not mention it among the birds of Jamaica."

As Dr. Gundlach states that "even from the nest the young male has only one transverse bar on the tail," it seems an important feature in the Cuban bird, for Audubon and Nuttall both speak of the young male of *sparverius* as having the tail marked with numerous transverse bars of black, which agrees with Mr. Cassin's account.

I have always thought, as stated by Wilson and Audubon, that the female of *sparverius* differed from the male in having the back, wings, and tail rufous with numerous transverse bars of black, but, as noticed by Dr. Gundlach, Mr. Cassin makes no difference in the sexes of the adult.

Dr. Gundlach's specimens of *sparveroides* are, without doubt, accurately marked, and the sexes differ in plumage in the same manner as those of *sparverius* are said to do by Wilson and Audubon; judging from analogy, the two species would be supposed to resemble each other in this particular.

Of the specimens from Cuba, seven are adult males; all of these are without the rufous spot on the crown; in five, the outer tail feather is dark rufous on both webs, without spots, except the subterminal bar; of the other two, one has the outer web of this feather pale rufous, and the other has it white, both also without spots.

There are two young males, one only has the red spot on the vertex; both are nearly white below, slightly tinged with rufous and almost unspotted—a few spots on the sides of one; in each the inner web of the outer tail-feather is rufous, and the outer web whitish, with two or three nearly obsolete spots next the shaft.

Five of the adult birds are deep rufous brown on the breast and abdomen, being more or less so on the thighs; and below are almost unspotted, but two or three having a few dark spots on the sides.

The older males of this species have their backs dark slate-blue, in some individuals intermixed with rufous; in the younger the back and rump are rufous; the wing-coverts and smaller quills, at all ages, are slate-blue, marked with a few black spots.

Two adult females have their heads on the crown very dark slate, and the under parts deep rufous brown, spotted and barred with black.

Two young females have the crown lighter, with the centre red; the under parts nearly white and marked with small longitudinal spots of pale rufous.

All the females have the back, tertiaries, wing-coverts, and tail ferruginous, transversely barred with black.

T. sparverius. Two United States specimens, adult males, are rufous below, of a much lighter shade than the Cuban species, and but sparingly spotted; they are without the red spot on the vertex, and have broad spots or imperfect bars on both webs of the outer tail feather.

Two others, also adult males, have the red spot on the crown, are nearly white below, and very much spotted; they have the inner web of the outer tail feather rufous but unspotted; the outer web is white, and in one of them there are black spots next the shaft on the outer web.

The adult males have the back and scapulars generally rufous, in some cases partly slate-blue, the wing-coverts and tertiaries greyish-blue, with black spots more numerous than in *sparveroides;* the lower part of the abdomen and thighs nearly white.

Four adult females (or birds in the plumage generally assigned to this sex) have the crown dark slate-blue, three of them with the red central spot; the back, wing-coverts, and tail deep rufous, closely barred with black; the under plumage of one is dull rufous (not dark), the others are very pale rufous, and all are largely marked below with longitudinal spots of rufous brown.

The characters in which the two species differ most are as follows:

T. sparveroides, adult male. The upper plumage dark slate-blue, and being without the red spot on the crown; in many specimens the under parts are very deep rufous, including the thighs, and almost unspotted; the outer tail feathers without bars.

The young male is very little spotted below.

The adult female has the dark markings beneath of a transverse character.

The young female is sparingly marked below with small longitudinal stripes of pale rufous. In the males that have the deep rufous color below, the light markings on the inner webs of the primaries are bluish-grey, and the dark bars blackish-grey; the birds that are light colored below have these markings more defined and almost white and black.

T. sparverius, adult male. The back usually rufous, and the vertex generally with the red spot, but not always; many of the quite adult birds are much spotted on the under plumage, and when rufous on these parts, it is never of the deep brown shade seen in the Cuban bird; the thighs are light colored or white, and the outer tail feather usually barred. The inner webs of the primaries are barred with black and white, with no approach to the grey shades of the other species.

The females are marked below with large longitudinal blotches of brownish rufous.

I feel well satisfied that the two species are distinct, for with thirteen specimens from Cuba before me, there is not one which does not differ in some of the characters pointed out from the eight United States birds.

D'Orbigny, in the Hist. of Cuba, gives a very accurately colored figure of the male *sparveroides* in the dark plumage, but he considers it a variety of *sparverius.*

Vigors, in the Zool. Journal, describes the light-colored individuals from Cuba as *sparverius*, though apparently with some doubt as to its correctness.

Mr. Saussure's description and plate cited above appear to resemble the dark-colored female *sparveroides*, as stated by Dr. Gundlach. He, however, puts his bird in *Hypotriorchis*, and a comparison of the plate with a female from Cuba, shows some important differences; the back, wing-coverts, and smaller quills, are of the same dark color as the head in his figure, not ferruginous, transversely banded with black, as in the Cuban female; some of the tips of the wing-coverts and of the quills only being edged with pale rufous; in the plate there is no appearance of the white spot under the eye, and instead of the whitish throat and chin of the Cuban bird, the dark ferruginous color of the under plumage extends up to the bill, with a line of white separating the color of the throat from the dark color of the cheeks; in its under plumage otherwise, and the markings of its tail, it is very much like the Cuban female. Mr. Saussure does not give the sex of his bird.

If Dr. Gundlach is correct in the identity of the species from St. Domingo and Cuba, Gmelin's name of *Dominicensis* will have priority.

2. Accipiter Gundlachi, nov. sp.

Astur Cooperi, Lembeye, Aves. Isl. Cuba, 1850, p. 17.
Nisus pileatus, " " Supplement.
Astur pileatus, Gund. Journ. fur Orn. Nov. 1854.
" *Cooperi*, Cabanis " "

Adult male. Front, crown, and occiput sooty black; upper plumage dull bluish ash, the feathers of the back with brownish margins; tail of the same color as the back, partly tinged with dull rufous and crossed with four brown bars, three of which are imperfect, being but little developed on the outer webs, the outer bar, however, crosses both webs, and is narrowly tipped with white; quill feathers brown, having the shafts, as are also those of the tail feathers, reddish brown; cheeks dusky ash; space forward of the eye pale dull rufous; a line of whitish feathers runs along the edge of the crown and extends over the eye; throat ashy white tinged with rufous; sides of the neck, upper part of the breast, and a band running to the hind neck, greyish ash; lower portion of the breast and upper part of the abdomen rufous, the feathers very narrowly edged with dull white, lower part of abdomen of a paler rufous, with transverse bars of dull white; long feathers of the sides greyish ash tinged with rufous and destitute of bars or spots; sides just above the junction of the tail plain rufous; thighs of a bright but rather pale rufous, the feathers having darker sub-marginal ends, terminating with very narrow edgings of dull white; under wing-coverts and axillars bright rufous barred with white; the feathers of the throat, breast, and sides have their shafts dark brown; upper tail-covers greyish ash, lower white; bill horn color, with a whitish mark on the tooth and also on the edge of the lower mandible near its base; legs greenish yellow.

Length about 18 inches; wing from flexure 9⅞; tail 7⅞; tarsus 2⅞.

This specimen is labelled *Astur pileatus*, and was received some months since. I wrote to Dr. Gundlach, stating that it was probably a new species, and below give an extract from his letter in reply.

"If, after another examination, you consider the species a new one, you may publish its description. I have nothing to say on its plumage, for you have the specimen, but will mention its measures, and the color of the naked parts. The only specimen found here was a male, and was shot at Hanabana in Nov., 1849. I know nothing of its habits. Cere and cheeks greenish yellow; feet pale yellow, with a greenish hue; iris red.

"Length 0·457; extent 0·807.

"I have seen here a young *A. Cooperi* received from New York, and I am led to suppose that the Accipiter from Cuba, which we believed to be *Cooperi*, is the young of the preceding species. For this reason I send a Cuban *A. Cooperi*, and if you can discover any difference from the true one, you may describe it as the young of the preceding, for I am almost convinced now that they are both the same. It is found in different localities, having seen it not only in low marshy swamps, but on the highest mountains, throughout the whole island. I once shot a young one on high ground, which, by the down that yet covered it, was certainly bred very near that place. I also send this specimen.

"Its flight is rapid and almost in a direct line, never having seen it describe circles, nor does it mount to any considerable height, and is so daring that it seizes young chickens in the farm-yard under the eyes of the husbandman. Its cry often repeated resembles 'kec.'

"Length of a ♂ 0.500 extent 0·890 tail 0·230.
" young ♂ 0.452 " 0·817 " 0·205.
" " ♀ 0.540 " 0·935 " 0·250.

"The extremity of the wing from the end of the tail (when shot) was, in the male, 0·120, and in the female 0·150. Cere yellowish green, feet and iris bright yellow."

The two specimens of the young mentioned above, are clearly those of the present species. They are dark umber brown above, with a tinge of deep rufous on the breast and sides of the neck; the dark longitudinal stripes on the under surface are of a much larger size than those of *Cooperi*, and cover the entire abdomen; the sides are heavily barred with rufous brown, and the feathers of the thighs have their ends marked with large guttate spots of rufous, assuming the form of irregular bars; *Cooperi* has these parts marked with elongated guttate stripes that are quite narrow on the thighs. The tail is marked much like that of *Cooperi*, but the colors are more obscure.

Remarks.—A very marked feature in the adult of this species is the ash color of the breast and sides, which does not exist at all in *Cooperi;* the under surface is less marked with white than in that species; the thighs are nearly of a uniform rufous, which in *Cooperi* are conspicuously barred with white; in the latter the under wing-coverts are white, with longitudinal spots of rufous brown, whereas in *Gundlachi* they are rufous barred with white.

From *A. pileatus*, as figured in Pl. Col. pl. 205, it is also very different; the adult of that species has the top of the head dark slate, the upper plumage of a rather light slate-blue; wings dark slate; tail with four dark bands, whitish between; the under plumage uniform pale whitish-blue; thighs deep rufous; no appearance of bars on any part of the plumage; under tail-coverts white; bill bluish, under mandible yellow at the base; legs yellow.

It is perhaps not out of place here to remark, that G. R. Gray, Cat. of Birds, Brit. Mus., 1848, and Strickland, Ornith. Syn., 1855, both place *Cooperi* Bon. under *pileatus* Pr. Max., from which it is certainly distinct, and a well-established species.

3. Accipiter fringilloides, Vigors.

Accipiter fringilloides, Vig. Zool. Journ. III. 1827, p. 434.
Nisus fringilloides, D'Orbig. (R. de la Sag.) 1840, p. 18.
Accipiter fringilloides, Gray, List Birds, Brit. Mus. 1848, p. 71; Bon. Cons. Av. I. 1850, p. 32; Strick. Orn. Syn- 1855, p. 108, *sub A. fuscus.*
Astur fuscus, Lemb. Av. Isl. Cub. 1850, p. 16.
Nisus fringilloides et fuscus, Lemb. Av. Isl. Cub. Cat. p. 128.
" *fuscus*, Gund. Jour. f. Orn. Nov. 1854.

Adult male. The entire upper plumage is of a bluish slate color, darker on the head; the tail brownish, crossed with five bands of blackish brown and ending with white; primaries brown; sides of the head and of the neck of a uniform bright rufous (not of a deep color) and without dark striæ; chin and throat pale rufous white unspotted; under plumage white, with narrow transverse bars of pale rufous on the breast; and on the abdomen, sides, and thighs with very faint narrow bars of pale rufous brown, almost obsolete on the lower part of the abdomen and thighs; under tail-coverts pure white; bill black, plumbeous at base; legs yellow.

Length about 10½ inches; wing 6¼; tail 4⅞ : tarsus 1⅞.

Adult female, from Dr. Gundlach's collection. It is larger than the male, and is more distinctly barred on the breast, the thighs rather lightly so; it has the unspotted rufous cheeks, and the lower part of the abdomen is white, as in the male.

A young male from Dr. Gundlach is umber brown above, with the cheeks of a reddish brown streaked with dusky; the breast blotched with light brown, and bars of darker brown on the abdomen; lower part of abdomen and thighs white with faint brown transverse markings.

A young female is paler umber brown above, the sides of the head and neck having dusky streaks and showing scarcely any coloring of rufous; sagittate blotches on the breast of a pale rufous brown, with narrow transverse waving lines on the abdomen and thighs of a paler brown.

Another young female from Mr. Forns's collection has the sides of the head rufous brown with dark streaks, and the throat pale rufous; the markings of the under parts darker and more clearly defined, the thighs more barred than in any of the others.

As is apparent from the synonymy of this species, ornithologists have been much in doubt as to its validity, some placing it under *A. fuscus* and others doing so with a query: for this reason I have thought best to give a description of each specimen sent to me.

A comparison of the adults of the two species shows their distinctness very clearly. In form, *fringilloides* is smaller and more slender than *fuscus*, but the clear rufous cheeks, nearly white under plumage, especially that of the thighs, are strongly in contrast with the rufous brown cheeks, streaked with dark brown, and the strongly marked rufous under plumage and thighs of *fuscus*.

All the specimens of the young under examination have the markings on their under plumage transverse, on the abdomen and thighs being waving and narrow, whereas in the young of *fuscus* these markings are longitudinal, large in size, and more extensively distributed, on the sides they are heart-shaped in form, and guttate on the abdomen and thighs.

Dr. Gundlach wrote as follows concerning this species, upon being informed that it was distinct from *A. fuscus:*

"I am happy to have discovered that the Cuban species is not *fuscus*, but *fringilloides*. I had long doubted their identity, though in Cabanis's Journal they are supposed to be the same bird. The specimen first sent you was a male, shot in July, 1857, at Bayamo. I now send an adult female, killed in June, 1855, at San Diego de los Baños; a young male killed in Sept., 1857, at Bayamo, and a young female at Hanabana, Oct., 1849. It hunts small birds to the size of blackbirds, and though its wings are so short, it flies with the greatest rapidity. It undoubtedly breeds on the island, for I once found a female in a pine wood which attacked me on my arrival in the same manner as the *Falco sparverius.*

I could not find the nest. The adult male and female have the bill black, with the base of a lead color; cere and feet yellow or pale orange; iris reddish grey. The bill in the young is black on the upper part, to the extremity, with a bluish base; cere and cheeks yellowish green; iris pale orange-grey; feet yellow. The measures of the fresh specimens were,

Adult, ♂ length 0·278, extent 0·508, tail 0·135.
" ♀, " 0·326, " 0·618, " 0·155.

4. Cymindis Wilsoni, Cassin.

Cymindis Wilsoni, Cass. Jour. Ac. Sc. Phil. 1847, n. ser. i. p. 21, pl. 7; Strick. Orn. Syn. 1855, p. 123.
" *uncinatus*, Lemb. Av. Isl. Cuba, Supl. 1850.
" " Gund. Journ. f. Orn. Nov. 1854.
Regerhinus " Caban. " "

Mr. Forns sent adult specimens, male and female, of this species, which agree very closely with Mr. Cassin's descriptions and figures.

5. Gymnoglaux nudipes, (Daudin.)

Strix nudipes, Daud. Tr. Orn. II. 1800, p, 199.
Athene nudipes, Gray, Gen. of Birds, Fol.; Strick. Orn. Syn. 1855, p. 173.
Noctua nudipes, Lemb. Av. Isl. Cuba, 1850, p. 23; Gund. Journ. f. Orn. Nov. 1855, p. 465.
Gymnoglaux nudipes, Caban. Jour. f. Orn. Nov. 1855, p. 465.
" " Newton? Ibis, i. 1859, p. 64, pl. i.

As this species is not very often met with, and having three specimens from Dr. Gundlach's collection under examination, I avail myself of the opportunity to give descriptions of them.

Adult male. Upper plumage umber brown, each feather with the edges lighter and tinged with pale rufous; the feathers of the back and the wing-coverts marked with roundish white spots near their ends; tail umber brown crossed with three imperfect narrow bars of dull rufous white; primaries dark umber brown with five or six whitish spots on the outer webs; throat, and a line over the eye, fulvous grey; sides of the neck intermixed with greyish white; under plumage grey intermixed with pale rufous, each feather marked down the centre with a dark brown streak; upper mandible horn color, whitish along the ridge, the lower is yellowish white; legs brownish yellow.

Another male is of a brighter rufous brown on the upper plumage, and more rufous on the breast.

Length 8 in.; wing 5¾; tail 3½; tarsus 1⅜.

The female sent does not differ materially from the male, it is nearly white on the breast and abdomen, with the streaks fewer, narrower, and lighter in color.

The figures given in the Ibis (referred to at the head of this article) of the birds brought from St. Croix by Messrs. A. and E. Newton, strike me as so different from the Cuban birds, that I consider them to be distinct species; the round white spots on the back and wing-coverts, which are so conspicuous a character in the Cuban bird, are not at all apparent in the figures, and the narrow transverse waving lines on the head, neck, and back, as portrayed in the figures of the St. Croix birds, are not perceptible in the Cuban; on the contrary, the dark markings are large, rather obscure, and longitudinal; the tail of the St. Croix bird appears to be closely and distinctly barred, whereas, in the specimens before me, the bars on the tail are few, and in the form of almost obsolete spots.

The figures in the Ibis having every appearance of being accurately drawn, I have no hesitation in pronouncing the St. Croix bird to be distinct from the Cuban; the latter is assuredly the true *nudipes*, as it agrees with Latham's description, in which he distinctly mentions the "white spots on the wing-coverts." Latham's account is no doubt accurately compiled. I propose for the St. Croix bird the specific name of *Newtoni*, in compliment to Alfred Newton, Esq.

The two species may be thus characterized—

Gymnoglaux nudipes Daudin. Upper plumage umber brown, each feather edged with light rufous; back and wings conspicuously marked with roundish white spots.

Gymnoglaux Newtoni Lawrence. Upper plumage rufous brown, the head, neck, and upper part of the back crossed with narrow waving lines of dark brown; the back and wings without the white spots.

6. Glaucidium siju, (D'Orbigny.)

Noctua siju, D'Orbig. (R. de la Sagra), Hist. Nat. Cub. 1840, p. 33, pl. 3; Lemb. Av. Isl. Cub. 1850, p. 128; Gund. Jour. f. Orn. 1855, p. 465.

Athene siju, Gray, Gen. of Birds.

Nyctale siju, Strick. Ornith. Syn. 1855, p. 177.

Glaucidium siju, Caban. Jour. f. Orn. Nov. 1855, p. 465.

Male. Upper plumage umber brown, the head above and occiput marked with numerous very small oval spots of white, on the front tinged with rufous; back and wing-coverts barred with pale rufous, the greater coverts having roundish white spots on the outer webs near the end; primaries and secondaries marked with white spots on the edges of their outer webs, and crossed with faint bars of dull rufous; tail brown, the two central feathers crossed with five narrow bars of white, the same number of bars on the other tail feathers are rufous, becoming white at the edge of the webs; throat and sides of the head greyish white; on the lower neck and upper part of the breast is a bright rufous band which extends around on the hind neck; upper part of abdomen white, blotched with bright rufous and barred on the sides with the same color; lower part of abdomen and under tail-coverts white, the latter with light brown centres; legs densely clothed with greyish white feathers, rufous on the thighs; bill and feet yellow.

Length about 7½ inches; wings 4; tail 3¼; tarsus 1.

The female is much the same in plumage, but is smaller; the wing measures 3⅝ in. and the tail but 2½. The females in this family are usually the largest, but I have given them as marked.

Remarks.—This small species is much like *G. gnoma*, from California, the spots on the head of *siju* are however much smaller and whiter, and the under plumage more rufous.

7. **Antrostomus Cubanensis,** nov. sp.

Caprimulgus vociferus, D'Orbig. (R. de la Sagra), Hist. Cuba, 1840, p. 98; Lemb. Aves Isl. Cub. 1850, Catal. p. 130.

Antrostomus vociferus, Gund. Journ. f. Orn. Jan. 1856, p. 6.

Adult male. Upper plumage dark ash, minutely mottled with dull rufous and grey, the feathers conspicuously marked with longitudinal stripes of black in their centres; a line extends from the bill over the eye and along the crown of greyish white, tinged with pale rufous and intermixed with black; the tertiaries ochraceous-white, beautifully variegated with black, and having near the end of each feather an irregular patch of velvety black; wing-coverts the same color as the back, some of them marked near their ends, with ochraceous spots; primaries dark-reddish-brown sprinkled with dull rufous and grey at their ends, and having bright rufous spots arranged regularly on their outer webs, there are spots also on their inner webs, more obscure in color and assuming a mottled form; secondaries dark brown, mottled with grey on the outer webs, and tinged with rufous on the inner; tail very full, of a fine deep brown, the two central tail feathers closely banded with curving bars of mottled grey and pale rufous, the next feather on each side, with the bars dull rufous, and rather narrowly tipped with ochraceous-white, less in extent on the inner web, the three outer feathers are irregularly barred with dull rufous mottling for their basal half, their ends for about an inch creamy-white, with ochraceous edges; throat dark brown, minutely freckled with rufous, the neck immediately below this color crossed with a band of pale rufous; a line of pale rufous-white or ochraceous spots extend along below the under mandible, and down the side of the neck, a few spots of the same in a line below the eye; on the side of the neck enclosed by these spots and the band across the throat is a triangular blackish-brown patch, speckled with rufous; sides of the head brown, freckled with minute rufous spots; feathers of the breast and abdomen ochraceous white, more or less tinged with rufous, and having their centres dark brown, and their sides and ends barred and mottled with the same color; the exposed ends of the feathers being but little mottled give quite a light appearance to the under plumage; lower part of the abdomen and under tail-coverts dull pale rufous, the feathers of the latter with dark markings along their shafts; sides under the wings dull rufous narrowly barred with dark brown; under wing-coverts brown mottled with rufous; tarsi clothed in front with rufous brown feathers; the bill is light brown, black at the point, and having very strong bristles, some of which are nearly two inches in length, and furnished with lateral filaments; feet brown. Length about 11½ inches; wing 7½; tail 5¾; tarsus ½.

The female does not differ much in appearance from the male, except in having the white ends of the three outer tail feathers much less in extent and more tinged with ochraceous; in size it is rather smaller.

A nestling is of a rather bright rufous color, variegated with black, and having the throat paler.

Remarks.—This bird which heretofore has been mistaken for *A. vociferus*, differs materially from that species, more particularly in size, and in the form and white markings of the tail, the feathers of which are very broad, and the white occupying about an inch at the end, whereas in *vociferus* it extends for half their length; the colors are lighter and more rufous in *vociferus*.

Both specimens being mounted, I cannot give the length exactly, but it appears to be little if any smaller than *carolinensis*, the head being quite as large and the tail more full, but the wings are a little shorter; the white on the tail of *carolinensis* is restricted to the inner webs.

This new species is very much like *A. nuttallii*, in the shape of the tail, and in the even manner in which the white crosses the ends of the outer feathers.

Below are Dr. Gundlach's remarks on this species:

"I am aware of your observations on this new species, and am also happy to find my doubts were well founded. The name 'vociferus' shall not remain in the catalogue, and in answer to your question will say, that the bird mentioned under this name in La Sagra and Lembeye's works, and in my Catalogue in Cabanis Journal, is this same species. You will name and describe it. I now send you a female.

"I have observed this bird in the small islands in the Cienega de Zapata, and on the coast of Manzanillo, that is, on the southern coast of the central and eastern parts of the island. I cannot say whether it is not found in other places.

"From the month of March its voice may be heard, in which there is not the least resemblance to the words 'whip-poor-will.' It breeds on the island, and I believe it emigrates in autumn, for I have not observed it in winter.

"Length ♂ 0·295 extent 0·548.
" ♀ 0·285 " 0·525.

"The extremity of the wings is 0·024 from that of the tail. Bill brown with the end black; iris very dark brown; feet brown."

8. Chordeiles minor, Cabanis.

Chordeiles virginianus, Lemb. Av. Isl. Cub. 1850, p. 51.
" *minor*, Cab. Jour. f. Orn. Jan. 1856, p. 5.
" *gundlachi*, Lawr. Ann. Lyc. N. Y. vi. Dec. 1856, p. 165.

This species which has been considered in Cuba the same as our *C. virginianus*, I described as new, from specimens sent by Dr. Gundlach, not knowing that Cabanis had already proposed a name for it, if further comparison proved it to be different from *virginianus*, as he judged it might be from its smaller size.

In my description the plumage of the adult female was not given; it differs from the male in being rather larger, in having the band on the throat pale rufous, and the tail being without the white band; in other respects the two sexes do not differ.

9. Chordeiles popetue, (Vieillot.)

Caprimulgus popetue, Vieill. Ois. Am. Sept. 1, 1807, p. 56, pl. xxiv.

Among the specimens of birds sent me by Dr. Gundlach is a female of this species. It must therefore remain as a bird of Cuba, but is evidently not often obtained, the common species there being *C. minor*.

Dr. Gundlach writes me,

> "I was glad to find that my supposition was correct, that the specimen of Chordeiles was *virginianus*, and I have with pleasure added this name to the catalogue of Cuban birds. I believe then that with the exception of that single specimen, all those we have here in our collections are C. *minor*."

10. Atthis Helenae, (Gundlach.)

Orthorhynchus Helenae, Gund. Lemb. Av. Isl. Cub. 1850, p. 70, pl. x.
" *Boothi*, Gund. Jour. f. Orn. Mch. 1856, p. 99.
Calypte Helenae, Gould. Mon. Troch. part xi. pl.

Male specimens of this beautiful little species have a well-defined terminal black band on the tail, nearly equal to one quarter its length; in the young male, as well as in the female, it exists also inside of the white tips, and occupies more space than in the adult male.

I have thought best to note this character, as Mr. Gould in his monograph states that it appears in a drawing sent to him by Dr. Hartlaub, but he did not find it in his specimens, which were somewhat imperfect; he therefore was uncertain about it, and thinks his figures "may not be quite correct on this point."

11. Dendroica albicollis, (Gmelin.)

Motacilla albicollis, Gm. Syst. Nat. 1, 1788, 983.
Sylvia albicollis, Lath., Ind. Orn. 11, 1790, 535.
" *æstiva*, Lemb. Av. Isl. Cub., 1850, p. 31.
Rhimamphus æstiva, Cab. Jour. f. Orn., Nov. 1855, p. 472.

Dr. Gundlach has sent specimens of this species, which has always passed as *æstiva* in Cuba. As it appeared to differ in its habits from those of the United States birds, he wished a comparison made. He writes respecting it as follows:—

> "As I read in the Pacific R. R. Reports, and as Wilson and Audubon mention this bird as common in gardens and fruit trees, while our species is only found in mangrove trees near the sea shore (Avicennia and Rhizophora), I send an adult male, another younger, and still a younger one, that you may compare them with your species."

The male, the most adult, differs from *æstiva* in having the entire crown of a deep orange color; in other particulars of plumage it does not differ materially, but the bill is decidedly stronger, being higher at the base; the younger specimens also show this character of the bill equally as well. The specimen of middle age has the whole upper plumage of a clear olive green, and the under parts of a deep bright yellow, with the red streaks well defined; in the young of *æstiva* all the colors are pale and the red streaks very faint, consequently the contrast between the young of the two species is more marked than in the adult state.

The youngest male has the upper plumage of the same green color as the older one, except that on the hind part and sides of the neck it is of a clear bluish-ash; the centre of the throat is white, and on the breast are some patches of the same color, which is apparently being replaced by the pale-yellow, which prevails on the rest of the under parts; the red streaks in this specimen are faint. In this plumage it agrees with *albicollis*, Gmelin, which has been generally placed as a synonym to *æstiva*, but it must now be restored as an independent species.

Gmelin states that the female has the hind neck greenish-ash —if this is the correct plumage of the female, the young male appears to resemble it.

Gmelin gives St. Domingo as the habitat of his species, which adds to the probability of the Cuban bird being similar.

The restoration of this species is another instance of the importance of a strict comparison of birds from different localities which are thought to be identical.

Mr. Cassin was much interested in the above specimens, never having seen any from Cuba, more particularly as he was at the time engaged with an investigation of the species allied to *æstiva*. He suggested that I should examine them carefully, as he thought the Cuban species, from its recorded habits, would prove to be different from *æstiva*, and was probably one of the older species confounded with it.

From Dr. Gundlach's note it is evident he also suspected it was different from the United States *æstiva*, for the same reason.

12. Empidonax acadicus, (Gmelin.)

Muscicapa acadica, Gm. Syst. Nat., 1788, p. 947.
" *pusilla*, Lemb. Av. Isl. Cub. Cat., 1850, p. 129.
Tyrannula " Gund. Jour. f. Orn., Nov. 1855, p. 480.
Empidonax pusillus, Caban. " "

Dr. Gundlach sent me his specimen of the so-called *pusillus*, which on examination proves to be *acadicus*.

It was hardly probable that *pusillus*, which inhabits west of the Mississippi, would occur in Cuba.

13. Vireosylvia altiloqua, (Vieillot.)

Muscicapa altiloqua, Vieill. Ois. Am., Sep. 1, 1807, p. 67, pl. 38.
Vireo longirostris, Sw. F. Bor., Am. 11, 1831, p. 237.
Vireosylvia olivacea, Gosse, B. of Jam., 1847, p. 194.
Vireosylvia altiloqua, Bon. Cons. Av. 1850, p. 330; Cass. Birds of Cal., Tex., &c. 1856, p. 221, pl. 37.
Vireo olivaceus, Lemb. ? Av. Isl. Cuba, Cat., 1850, p. 128.
Phyllomanes barbatulus, Caban. ? Jour. f. Orn., 1855, p. 467.

Two specimens from Dr. Gundlach seem to agree with the bird from Florida, which is decided by Mr. Cassin to be the same as the species found in Jamaica, and considered by him to be the true *altiloqua*. Until within a few years, this bird has passed in Cuba as *olivacea*, from which it may be known by the blackish stripe that runs from the base of the lower mandible, downward on each side of the neck. In M. Forns's collection is a specimen of *olivacea*, showing that species to be found in Cuba also.

14. Sturnella hippocrepis, (Wagler.)

Sturnus hippocrepis, Wagl. Isis., 1832.
Sturnella Ludoviciana, Lemb. Av. Isl. Cub. Cat., 1850, p. 130.
" *hippocrepis*, Gund. Journ. f. Orn., Jan. 1856, p. 14.

This is somewhat smaller than *S. magna* of the United States, and I think is specifically distinct. It would be difficult to point out any reliable differences in coloration, especially of the upper plumage, as individuals even of the same species are very variable; the most apparent differences are in the black pectoral band being narrower, the bill broader at the base, and tapering more regularly to the end, where it is more pointed than in *magna;* the tertiaries are equal in length to the primaries; in my specimens of *magna* they are much shorter. This is a good character if a permanent one; it exists in the two adult specimens before me.

Male, length 9 in.; wing 4; tail 3; bill $1\frac{5}{16}$; tarsus $1\frac{1}{8}$.
Female, " $8\frac{3}{4}$; " $3\frac{3}{4}$; " $2\frac{3}{4}$; " $1\frac{1}{4}$; " $1\frac{7}{16}$.

A comparison of the Cuban birds with specimens from Jalapa, Mexico, also called *hippocrepis*, shows them to be of about the same size, differing only in the pectoral band appearing broader in the Mexican bird, and the tertials much shorter than the primaries, but this last may not be a reliable character.

15. Icterus cucullatus, Swainson.

Icterus cucullatus, Sw. Philos. Mag., i., 1827, p. 436.
" *Bullockii*, Gund. Jour. f. Orn. Jan. 1856, p. 10.
Hyphantes costototl Caban. " "

Male. Front, head, hind part and sides of the neck, rump, upper tail-coverts and entire under plumage, except the throat, deep yellow inclining to orange, the hind neck and rump a little obscure, back dusky yellowish olive, darker on the inter-scapular region; tail black, some of the feathers olive, no doubt when fully mature all are black; wings brown, the ends of the middle coverts and the outer edges of the greater, narrowly edged with white; under wing coverts, yellow; space in front of the eye to the bill, throat, and fore part of neck to the breast, black; bill black, bluish on the sides of the lower mandible at the base; legs and feet black.

Length—$7\frac{1}{2}$ in.; wing $3\frac{1}{4}$; tail $3\frac{3}{4}$; tarsus $\frac{7}{8}$.

The bird above described is from Mr. Forns's collection, and is not fully mature. In size and general appearance it so much resembles *I. cucullatus*, that at present I am inclined to consider them the same. In its present plumage there is no black on the back, but the olive-green occupies the same position and is about as much in extent as the black in the adult *cucullatus*; the black on the face is forward of the eye, not extending under it to the posterior angle as in *cucullatus*.

A young male from Dr. Gundlach's collection is greenish-olive above, with the rump yellowish and the tail greenish-olive; the under plumage is of a paler yellow than in the adult, the chin and throat only are black.

Remarks.—The young male was sent me about three years ago by Dr. G., who supposed it was *Bullockii.* I wrote it was not that species, but probably the young of *I. spurius* in one of its changes. Since then Mr. Forns obtained the more adult bird.

The following note from Dr. Gundlach refers to this species:—

> "I believe that the young sent you in 1856 is the same with the one since sent by Mr. Forns. There is at present a man travelling about the island who exhibits a small collection of birds. I saw it in Matanzas and noticed a specimen of this bird, brought, as I was told, from Caraccas; this was some time before I had seen Mr. Forns's bird. I supposed that the one in the collection was *X. cucullatus.* My bird was found in April, 1852, near Cardenas, on a plain in which are seen several small streams. The friend that sent it assured me that it was a male. The one shot by Mr. Forns, near Havanna, was found about the same time last year."

16. Icterus Dominicensis, (Linnaeus.)

Oriolus Dominicensis, Linn. Syst. Nat. 1766, i., p. 163.
Xanthornus " D'Orb. (R. de le Sagr.) Hist. Cub. 1840, p. 115; Lemb. Av. Isl. Cub. 1850, Cat. p. 130; Gund. Jour. f. Orn. Jan. 1856, p. 10.

Mr. P. L. Sclater, in the Proc. Zool. Soc. 1857, p. 7, states that *P. Dominicensis* of Bon. Consp. Av. vol. i. p. 432, is distinct from the present bird, and describes it as a new species, under the name of *Wagleri.* Prof. Baird in Pacific R. R. Rep. vol. ix., cites Bonaparte's name as a synonym, under *Wagleri:* this has induced Dr. Gundlach to inquire wherein the two species differ. I have therefore thought a short description of them might not be out of place.

I. Dominicensis is black, having the lesser wing-coverts, the bend of the shoulders, the under wing-coverts, the rump, upper tail-coverts, and thighs golden yellow, paler under the wings; the lower part of the abdomen between the thighs is dull orange.

Length 8 in.; wing 3¾; tail 3¾; tarsus 1.

I. Wagleri has the entire head, neck, upper part of the back, wings, and tail black; the lesser and middle wing-coverts, the middle and lower part of the back, rump, breast, and abdomen are orange-yellow. Length 9½ in.; wing 4½; tail 4¼; tarsus 1⅛.

17. Pyrrhomitris cucullatus, (Swainson.)

" *Carduelis cucullatus*, Sw." Zool. Ills. 1820–1, pl. 7.
"*Fringilla Cubae*, Gerv." Lemb. Av. Isl. Cub. 1850, p. 130; Gund. Journ. f. Orn. Jan. 1856, p. 10.
Pyrrhomitris cucullatus, Bon. Cons. Av. 1, 1850, p. 517.

This species, Dr. Gundlach writes me, is not considered to be an inhabitant of the island, the few obtained have been supposed to be birds which had escaped from confinement; but in the Museum of the Phila. Acad. are two or three specimens from the north side of Cuba, from a section to which this suspicion would not attach; it probably is a resident of the island, but restricted to certain localities.

Dr. Gundlach's specimen is labelled *F. Cubae*, which he suspected was not correct, and wished to ascertain its true name.

18. Spizella socialis, (Wilson.)

Fringilla socialis, Wils. Am. Orn. 11, 1810, p. 127, pl. xvi.
Emberiza pallida, Lemb. Av. Isl. Cub. 1850, p. 54; Gund. Jour. f. Orn. Jan. 1856, p. 7.
Spinites pallidus, Cab. " " "

I suspected the true *S. pallida* did not exist in Cuba, and wrote for a specimen, which proved to be the above species in winter plumage; in this dress it somewhat resembles *pallida.*

19. Crotophaga rugirostris, Swainson.

Crotophaga rugirostra, Sw. Lard. Cyc. 2¼ Cent. An. in Men. 1838, p. 321.
" *ani*, D'Orbig. (R. De la Sagra) Hist. Cub. 1840, p. 154; Lemb. Av. Isl. Cub. 1850, p. 132; Gund. Jour. f. Orn. 1856, p. 105.

Two specimens in fine plumage were sent me by Dr. Gundlach, which I make out to be *rugirostra*, Sw., that is, identical with the bird, decided to be this species, described and figured in Jard. and Selby's Ills. Orn. n. s. pl. xli., which came from Tobago. I supposed they would be the same as the species obtained by Dr. Bryant in the Bahamas, which he calls *laevirostris*, but they are different, his species being smaller and the bill destitute of wrinkles.

The male measures in length 14½ inches; wing 6¼; tail 8; tarsus 1⅜.

The female does not vary particularly in size or plumage.

20. Ortyx Cubanensis, Gould.

Ortyx Virginianus, D'Orb. (R. De la Sagra.) Hist. Cuba, 1840, p. 182; Lemb. Av. Isl. Cub. 1850, Cat. p. 132.
" *Cubanensis*, Gould, Mono. Odontaph. pl.; Gund. Journ. f. Orn. Sept. 1856, p. 337.

The distinctness of this species from the common U. States' bird is now well established, but for a long time, in Cuba, they were supposed to be the same. I thought it possible both species might be found there, but Dr. Gundlach says they have but the one.

It is distinguished from *O. Virginianus*, by its smaller size, generally darker colors, and more mottled character of its upper plumage; the male has the rufous coloring of a much deeper shade, the black on the neck and breast more in extent, and the black transverse markings on the abdomen very much broader than in the U. States' species.

21. Butorides brunnescens, (Gundlach.)

Ardea brunnescens, Gund. Lemb. Av. Isl. Cub. 1850, p. 84, pl. 12.
Oniscus " Cab. Journ. f. Orn. Sep. 1856, p. 344.

The opportunity to examine this rare species has tempted me to give a short description of it, more particularly as Lembeye's figure does not satisfactorily represent the specimen sent, which is fully adult.

The top of the head and long occipital feathers, back, tail and wings, are dark glossy green; the scapulars and interscapulars pale green, washed with bluish grey, having light grey shafts; the wing-coverts very narrowly edged with rufous; the entire neck and long feathers extending over the breast bright brownish chestnut, paler on the chin; abdomen dark plumbeous ash, tinged with rufous on the sides.

The wing measures 7 inches; tail 3; tarsus 2⅛; bill 2⅜.

It scarcely differs in size from *B. virescens*, of which it is a remarkable representative, but unmistakably distinct. The plumage generally is darker than in *virescens*. In the appearance of their upper parts the two species closely resemble each other, but *virescens* has the chin and a central line down the throat and neck, also a stripe on the side of the head, white, these parts in *brunnescens* are uniform in color, with no trace of white, this species is also without the light edgings to the wing-coverts and smaller quills, so conspicuous in *virescens*.

Dr. Gundlach writes me that he has only met with it five or six times.

22. Symphemia semipalmata, (Gmelin.)

Scolopax semipalmatus, Gm. Syst. Nat. 1, 1788, 659.
Totanus semipalmatus Lemb. Av. Isl. Cub. 1850, p. 92.
" " *speculiferus*, Lemb. Cat. p. 133.
Symphemia semipalmata et speculifera, Gund. Journ. f. Orn. Sep. 1856, p. 351.

Dr. Gundlach sent a specimen of this species with another representing *speculiferus*, the latter has the tarsus longer than the one labelled *semipalmatus*, but that appears to be smaller than usual, the tarsus measuring but 2⅛ inches, the tarsus of the other 2½, this last is given by Prof. Baird as about the size in an extensive series of specimens of *semipalmata*.

Just the same variation in measurements is observable in examples from our coast, as in the two from Cuba. I therefore think there is not sufficient ground for their separation into two species.

23. Macroramphus scolopaceus, (Say.)

Limosa scolopacea, Say, Long's Exped. ii. 1832, p. 170.
Scolopax longirostris, Bell. Ann. N. Y. Lyc. v. 1848, p. 3.
Macroramphus scolopaceus, Lawr. " v. 1849, p. 4, pl. 1.
Macroramphus griseus, Gund.? Journ. f. Orn. Sep. 1856, p. 350.

Dr. Gundlach has sent one adult bird of this species in fine plumage; in this specimen the colors of the back and tertiaries are very clear, the rufous markings being particularly bright; the feathers of the upper part of the breast are each marked with a narrow subterminal dark band.

I have several specimens of this species obtained at different seasons, from early spring to late in summer. It may be distinguished from *M. griseus* by its larger size, being 12 inches in length; the bill is longer, measuring in different examples from 2¾ to 3 inches; the bare part of the tibia is about 1 inch in extent. In three of my specimens, which are in full summer plumage, the breast and entire abdomen are of a uniform rather pale rufous without spots or bars, but having the sides of the breast barred transversely with black. In one example from Texas the breast is barred in the same manner as in the one from Cuba. In the upper plumage the colors are deeper and brighter than those of *griseus*. In addition to the well-marked characters of this species, its rarity on our coast (but few being obtained each season) is further evidence of its distinctness from *griseus*, which is very abundant.

They make their appearance quite early in the spring. I have found them in the market in April, among English snipe (*Gallinago Wilsonii*), fully three weeks before any of the common species are seen.

24. Macroramphus griseus, (Gmelin.)

Scolopax grisea, Gm. Syst. Nat. i. 1788, p. 658.
Macroramphus griseus, Leach, Cat. Brit. Mus. 1816, p. 31; Gund. Jour. Orn. Sep. 1856, p. 350.

Of this there are two specimens, one is in the grey winter dress, but lighter in color than I have ever seen any here.

The length of this species is 10½ to 11 inches; the bills vary in length from 2⅛ to 2⅜ inches; the bare space on the tibia measures ¾ of an inch; the under surface is not entirely red, the lower part of the abdomen being white, the shade of red is duller and rather lighter than in *scolopaceus;* the breast is marked with small round black spots, the sides of the breast are also spotted, but not barred as in the preceding species; the flanks of both are transversely barred, but those of *scolopaceus* most conspicuously so.

25. Dendrocygna viduata, (Linnaeus.)

Anas viduata, Linn. Syst. Nat. i. 1766, p. 205.

Through the researches of Dr. Gundlach this fine species has been added to the list of Cuban birds. Last year he sent me an adult female for identification, and now writes as follows:

> "When you gave me the name of this species I compared it with the description and found it correct; though the name is not new to science, it is a valuable addition to our fauna.
>
> "A friend from Santiago de Cuba sent me a male, which differs from the female sent, in having the black from the back of the neck extending to the throat, this male was shot about the end of June of last year."

26. Spatula clypeata, (Linnaeus.)

Anas clypeata, Linn. Syst. Nat. i. 1766, p. 200.

Young male. Upper plumage umber-brown, each feather with a lighter margin; sides of the head and throat fulvous grey, the feathers with dark centres, chin fulvous white; breast and abdomen reddish brown, the feathers with pale edgings; smaller wing-coverts pale blue, secondary coverts brown, broadly ending in white, speculum metallic green; quills and tail brown.

Length about 15 inches; wing 8; bill $2\frac{1}{8}$; tarsus $1\frac{3}{16}$.

This specimen differs so exceedingly in size from *clypeata* that I was inclined to consider it distinct, but in its markings, especially of the wings, it so much resembles that species, and being immature, I have for the present concluded to so call it.

Dr. Gundlach considers it a hybrid, and writes as follows, in reply to my statement, that I could not make it agree very satisfactorily with any other species.

> "I at first supposed this bird to have been raised from the union of *A. discors* and *clypeata ;* I afterwards suspected it to be *cyanoptera* until I saw some specimens of that species. Now that you cannot discover it to be any species from North America, I return to my first supposition, however rare or unheard of the crossing of two species. I shot it in February, 1846, in a pond near Cardenas, and as it was the only one

killed in the flock, I do not know whether the rest were the same or not. Bill ashy brown with small black spots at the extremity. Length 0·447; extent 0·725; end of tail 0·020 from the end of wing.

"I suppose it does not belong to South America, for in that case it should rather be found here in summer."

27. Larus argentatus, Brunnich.

Larus argentatus, Brunn. Orn. Bor. 1764, p. 44.
" *marinus*, Lemb. Av. Isl. Cuba, 1850, p. 122.

Dr. Gundlach writes me,

"This is the specimen found by Lemboye in the market at Havana, and mentioned in his work as *marinus*. I have now my doubts whether it is this species or not, but it does not seem to be *argentatus*, for it is larger. Though it is not in good condition, I have kept it to discover its real name. It being besides a young bird, its true plumage cannot be known. I expect you to be able by the size and form of its bill to know it."

Remarks.—This example agrees very closely with a specimen in my collection of the young of *argentatus* of middle age.

My specimen of the young of *marinus* is larger, and stouter in form; the back mottled with much darker feathers, and the bill larger and stronger.

XXIV.—*Remarks on the Taconic System.*

By R. P. Stevens.

Read May 21, 1860.

The existence of a system of stratified rocks, older than the Potsdam sandstone, and fossiliferous, has been the mooted question of the day.

Mather, the brothers Rodgers, Hall, Sir William Logan, Hunt, and recently Pres. Hitchcock must be added to the list, maintain that there is no such system. That the Potsdam and calciferous sandstone are the lowest horizon of Palæozoic life; and that the slates, sandstones, and marbles, of Prof. Emmons' Taconic system, are but the metamorphosed rocks of the lower Silurian.

On the contrary side of the question we have Prof. Emmons, the proposer of the system, Safford, Jewett, Foster, in our country, and Barrande and Salter, in Europe, who maintain not only that this system of rocks is older than the Silurian, but that it was the cradle of palæozoic life.

Mr. Sterry Hunt, the accomplished chemist of the Canadian survey, carries the idea of metamorphism so far as to make the limestone of Central Massachusetts, the Devonian, altered by heat and chemical agency. Doctor Hitchcock lends his authority to the same view. Such is the present aspect of the controversy.

The fossils before the Lyceum this evening are from the Taconic and the Silurian, where it reposes upon the slates unconformably. The Silurian fossils are the *Maclura magna*, two specimens, *Cyrstoceras*, and *Orthoceras*, one of each, with fragments of others. The Taconic fossils are, *Paradoxides*, one specimen, *Graptolithes seculinus*, one specimen, and *Fucoides flexuosa.*

It was my intention to have laid before the Lyceum specimens of Brachiopods, new Trilobites, and stems of Encrinites, but my communications did not reach Albany in time.

Barrande places the Paradoxides in his primordial zone, as typical of it, and Salter, agreeing with him as to geological position, though not nomenclature, places it in his sub-silurian. Whatever the argument may be from Palæozoa, it is in able hands, and is daily increasing in favor of Dr. Emmons' views.

We propose in this paper to maintain the Taconic system, by the following arguments: 1st, its orography; 2nd, its structural geology; 3rd, the thickness of its strata; 4th, its unconformability with the Silurian.

1st. The orography of this system is quite peculiar to itself. Long valleys, lying between high mountains, having a north and south trend,—the mountains having an easy slope upon their eastern sides, but steep and abrupt upon their western,—their summits rounded, smoothed, or scarred by drift agencies or the ravages of time, every few miles broken off at either end, and lapping by the succeeding mountain, in an echelon arrangement; sometimes gently rising up from the south, and terminating abruptly at the north. The eastern valleys are floored with limestones and marbles, and through them up rise isolated mountains, flanked with the calcareous formations of the valleys.

The intelligent traveller, passing over this system from the east, from New Marlboro, Mass., to the City of Hudson, would be impressed with the following characteristic features. As he stands on the western edge of the primitive, and looks northwards, southwards, and eastwards, he sees, spread before him, an elevated country, gently rolling and swelling into ridges and subordinate hills. The rocks are all gneiss and granite, and vertical in their dip; the valleys are narrow and deep; the soil thin, and poorly rewarding the labor of the husbandman.

On the west he suddenly descends into the valley of the Konkeput, and finds a change has come over the whole scenery. The rocks are new to him; they are stratified, calcareous, arenaceous, or slaty; they have an eastward tilt; they abut sharply upon the primary; the valley is wide, swelling with knobs and ridges of gravel and drift; marbles and limestones underlie the surface; the springs flow with *hard water*, or hold carbonate of lime in solution; a new order of agriculture greets his vision; the whole scenery is changed, a change that did not escape the observation of Prof. Hopkins and of President Dwight, when they first travelled into this region.

From the Konkeput on to the Hudson river he passes over five of these parallel mountains, all having the same peculiarities, and three of the valleys filled with limestones. The limestones of the valleys, the slates and quartz of the mountains have all of them, for more than thirty miles in width of territory, the steep tilt eastwards.

At the crossing of the Claverack creek in Columbia county, quite to his surprise he finds a limestone capping the highest slate hill.

It is conceded by all geologists that the mountains of the American continent have been elevated at different geological periods; that the continent has undergone repeated oscillations, and that the dynamics elevating the continent have been different from those uptilting the mountains.

Pres. Hitchcock describes six systems of elevations in the State of Massachusetts. The *fourth* in his system is that which elevated these mountains, but in the order of nature it was the *second*, for the Silurian rests unconformably to the slates of these mountains, while these slates are unconformable to the primary. They were upheaved, then, before the laying down of the Potsdam sandstone, and after the close of the Taconic epoch.

The upheaving force *fractured* these rocks simultaneously in two different directions, one longitudinally in long lines of from five to thirty miles, and elevated them many thousand feet, as we may reasonably suppose. This elevating force threw them not up in folds of the strata, as the brothers Rodgers have stated, but in sharp lines of fracture bringing all the strata successively into view, and giving their present steep inclination eastwards. Simultaneously there was a transverse fracture, in an east and west direction, interrupting the longitudinal at various and irregular distances, and at the same time pushing the north end of the interrupted strata to the west of and by the south end, thus giving the mountains their echelon arrangements, as has been stated. In the wider valleys, isolated fractures and elevations sometimes took place.

Subsequently in the order of time there was a depression of the western edge of the system; the upturned edges were abraded, and furrowed into deep chasms, to form material for the nascent Silurian, and into these furrows and sometimes mighty chasms, as well as on the basset edges of the Taconic, the Silurian was laid down. Then followed another uprising, leaving the Silurian dryland, while the Devonian was being formed. Again another oscillation while the Carboniferous was being deposited. These various elevations and depressions we suppose to have been so gentle in their action, as not materially to disturb these rocks. At the close of the Carboniferous age, when the Apalachian system of elevation was exerted upon this continent, these rocks were subjected to further disturbances. The east and west dislocations were further extended, the already hardened material was crushed and comminuted, and the whole of this system underwent so marked a change, that many observers consider the Apalachian elevation the only one exerted upon these rocks. But no one system of elevation can satisfactorily explain all the phenomena of this interesting group of mountain strata.

These rocks had already been wasted by ocean forces, to yield material for the Silurian, and, perhaps, all the succeeding formations, when they, in common with all the eastern portion of our continent, were depressed beneath the seas, and subjected to all the varied operations of the drift forces, whatever they may have been.

On emerging from the waters for the last time, they were covered in many places with a coating of from 2 to 150 feet of transparent material. Miles in extent of their strata, and hundreds of feet in thickness, had been abraded and removed,—the overlying cap of Silurian had mostly been carried away, leaving only isolated patches in protected positions, and widely separated localities, for the geologist to infer their former presence in full force. Add to all, the metamorphism of being heated and cooled,—of large masses sliding by each other, thus producing electric and magnetic action,—remember also the chemical action and reaction that must have been present, and you will understand the magnitude of the task any investigator assumes when he attempts to decypher all the problems of the Taconic sytem.

Our second argument is from its structural geology.

Viewed comprehensively, and not descending to the minutiæ, the geology of this system is very simple. The main bulk of the mountains is composed of laminated or massive slates of various grades and varieties. One range on the east is capped with hornstone or massive silex. The valleys of the eastern portion are filled with calcareous deposits, with intercalated beds of slates and sandstone, and these beds also flank the eastern slope of the mountains. The western valleys are floored with the same slates as the mountains are composed of, while the mountains on the west are, or have been, capped with unconformable limestones or sandstones of a different age. The calcareous, slaty, or siliceous masses, whether rising into mountain heights or reposing in the valleys, have unmistakable appearances of having been sediments in their normal and primal condition. Their stratification, always regular,—the ripple marks still remaining upon the surface,—the water-worn rounded or brecciated character of the material composing some of the deposits, as well as their fossil contents, all give evidence of sedimentary origin.

We may suppose these sediments to have been originally deposited upon the floor of the primal ocean, which had primitive rocks upon its eastern shores. The first abrasion of the primitive would yield breccias and conglomerates, arenaceous beds would follow; these were succeeded by still finer argillaceous deposits, since hardened into slates; limestones followed, which have been metamorphosed into marbles.

These were repeated, the one upon and following the other, until the whole series was completed.

This simple statement of the structural geology brings us to the third argument,—the thickness of the strata composing this system.

The limestones on the east, we have been able approximately to measure. One thousand feet is the thickness in its present dilapidated condition, in the valley of the Konkeput, and we have good reason to infer that it once was more than 2000 feet thick. The magnesian slates are fully 15,000 feet in thickness. The limestones that followed were 4 to 600 feet thick; and the true Taconic slates of the state line of Columbia and Berkshire are full five miles thick. The roofing and other slates of Columbia Co. were three to three and a half miles in thickness.

In all, eleven to thirteen miles would be the maximum thickness; but allowing for any reduplication of the strata, or even a *folding* of the same, the minimum thickness cannot be less than five and one half miles,—a thickness much greater than the Silurian, Devonian, and Carboniferous, which succeed this eldest born of the sedimentary rocks.

Our last argument is the unconformability and superposition of the Silurian with the Taconic.

At Becraft Mt., Claurach, Kinderhook, and Ghent, in Columbia Co., at Greenoble and University Hill, in Rensellaer, at Bald Mt. and Mt. Toby, in Washington Co., and numerous other localities might be cited, where the Taconic has its usual steep inclination eastward, the lower Silurian either reclines horizontally upon the upturned edges, or in troughs worn in the slates, but in either case the superposition is manifest and unmistakable.

The maintainers of the metamorphic Silurian theory are driven to the following absurdities; that the Utica slate and Hudson River group of rocks, confessedly only a *few hundred* feet in thickness, have been so *plicated*, uptilted, and pressed together, as to fill a country more than thirty miles wide with their strata, at a steep inclination. And, moreover, that the lower members, as the Pottsdam sandstone, calciferous, chazy, and Trenton limestones, and, in one case, the Helderburgh limestone unmetamorphosed, are superimposed upon the uptilted and metamorphosed later rocks of the Utica slate and Hudson River group. How came the older reclining in a normal condition upon the later? The one changed, the other unchanged? Again, how came the upper Silurian limestones to thicken into two thousand feet of material in the distance of twenty-five miles,—in the one case metamorphosed into marble, and in the other case remaining in its usual thickness of a few hundred feet and unmetamorphosed?

And, once more, why should the uniform eastward tilt cease with the upper Silurian, and a new inclination be imposed upon the Devonian, if Central Massachusetts is but the Devonian metamorphosed?

If in Illinois we have the Carboniferous unconformable to the Devonian, upper Silurian, and lower Silurian, why may we not have the coal measures in Massachusetts and Rhode Island unconformed to the Sub-Silurian?

In the Taconic system we have a new volume added to the geological history of the earth, carrying us back into the history of its palæozoa to a new and lower horizon, as remote from the Silurian as it is from the Carboniferous. In its fauna and flora we have the primal forms of the biological alphabet, and though the generic character of its inscriptions extend into the Silurian, and, as for that matter, even up to the present time, its specific characters are essentially distinct.

NOTE.—Since the foregoing remarks were read, I have received a communication from Prof. Safford of the Tennessee Geological Survey, telling me that he finds in Tennessee a system of stratified rocks of great thickness, between the primary and Pottsdam sandstone.

On the south-east, then, we have the system, on the north-west in the Azoic of Foster and Whitney, on the north in the Huronian of Sir Wm. Logan, and in the north-east in the Taconic of Prof. Emmons.

To our State Survey belongs the honor of its discovery and proper placing of it in the geology of North America.

XXV.—*Description of a* New Species *of* Helix, *from Bougainsville Island.*

By Wesley Newcomb, M.D., of Oakland, Cal., Corresponding Member.

Read May 28th, 1860.

Helix Angasiana. (nov. sp.)

T. imperforatâ globoso-depressâ, solidâ, malleatâ, rufo-brunneâ, epidermide aureolo-tinctâ; spirâ brevi, obtusâ; anfr. 5 planiusculis, sensim accrescentibus, ultimo ad peripheriam obsolete carinato; suturâ valde impressâ, non marginatâ; aperturâ rotundato-lunari, intus albâ; peristomate reflexo; marginibus callo tenui junctis; columellari calloso, dilatato, adnato.

Shell imperforate, depressly globose, solid, malleated, epidermis reddish brown, tinged with golden; spire short, obtuse; whirls 5, slightly flattened, regularly enlarging, the last one slightly keeled at the periphery; suture well impressed, not margined; aperture roundly lunar, white within; lip reflected, the margins joined by a thin callus; columella thick, dilated, adhering.

Diam. maj. 60, min. 48, Alt. 34 mill. Aper. 26, mill. longa, 27, lata.

Hab.—Bougainsville Island.

Remarks.—This fine large Helix, dedicated to that excellent naturalist, Geo. French Angas, Esq., of Australia, has for its nearest allied species, *H. cornu militare* of St. Domingo. It differs in being somewhat smaller, in its malleated surface, less expanded lip, and more rounded aperture. It also approaches *H. Studeriana*, from which it differs in its greater solidity, hammered surface, and in its smaller and more rounded aperture.

XXVI.—*Descriptions of* New Species *of Birds of the Genera* Myiarchus *and* Phlogopsis.

By Geo. N. Lawrence.

Read 21st May, 1860.

Myiarchus Panamensis.

Second, third, and fourth quills longest, the first considerably shorter than the seventh. Upper plumage rather light umber-brown, the feathers of the crown having darker centres, and the back an olivaceous shade; tail brown, with a dull ferruginous tinge, the outer web of the outer tail feather dull white, with a very slight tinge of rufous, the central feathers with very narrow margins of pale rufous, the ends of all the tail feathers pale; wing-coverts umber brown, with their edges dull white; primaries and secondaries dark umber brown, with their outer webs very narrowly margined with dull white; tertiaries dark brown, with their outer edges pale yellowish white; the inner webs of all the quills are margined with pale yellow; under wing coverts yellow; throat and fore part of the breast clear bluish-ash, sides of the same color, tinged with olivaceous; abdomen and under tail coverts yellow; bill and legs black. Length $7\frac{3}{4}$ inches; wing $3\frac{9}{16}$; tail $3\frac{3}{4}$; bill from front $\frac{13}{16}$; from rictus $1\frac{1}{8}$; tarsus $\frac{7}{8}$.

Habitat.—Isthmus of Panama.

Remarks.—This species is about the size of my *M. cinerascens*, but the colors are much darker, and the bill longer and broader. Compared with *M. crinitus*, the color of the throat is of a deeper shade and the dark coloring on the sides more extensive, the abdomen is of a rather lighter yellow, the bill is about the same width at the base, but longer. From both species it differs in having no rufous coloring on the wings or tail, except the very slight tinge on the edge of the latter, in having the inner edges of the quill feathers pale yellow and the wings much shorter. In the absence of ferruginous it resembles *M. phæocephalus*, Sclater.

Two specimens were obtained by Mr. J. McLeannan, who states that it sits on the top of a tree, and has a cry very similar to that of the Royal Tody (*Muscivora Mexicana*), so much so that when he shot these specimens he mistook them for that species.

Phlogopsis McLeannani.

Head above umber brown, with a slight ochreous tinge, there is a deep black spot on both the upper and lower eyelid; hind neck encircled with a band of bright chestnut red; back, wing-coverts, tertiaries, and rump light umber brown, tinged with ochraceous or dull ferruginous yellow; feathers of the back, scapulars, tertiaries and wing-coverts ending with large spots of deep velvet black, and having pale ferruginous margins; these markings exist on the rump and upper tail-coverts, but become rather obscure towards the latter, when they are almost obsolete; tail deep blackish brown, with the two external feathers on each side tipped with white; primaries and secondaries dark umber brown with light brown edgings; throat and neck in front of a deep glossy black; breast and upper part of abdomen bright chestnut red, each feather being marked with a subterminal round spot of deep black; immediately below the black throat the red is without spots, and connects with the collar on the hind neck; centre of abdomen paler in color, and on the lower part becoming brown, with the markings less distinct; the under tail-coverts and thighs are ochreous brown, banded with black near the ends of the feathers, which have lighter terminations, these markings are rather obscure on the thighs; sides and inner covering of wings dull ferruginous brown; bill black, with the tip horn color; the tarsi and feet in the dried specimens are very pale yellow, probably light flesh color in the living bird; claws yellowish white. In life the bare space around the eye is light blue.

Total length 8 inches; wing 3¾; tail 3½; bill from frontal feathers 1⅜.; tarsus 1¼.

Habitat.—Isthmus of Panama.

Remarks.—One other specimen is of rather smaller dimensions, but they are precisely alike in plumage. They were obtained at a locality about equidistant from both oceans.

This is a larger and finer species than the two others embraced in this genus; it somewhat resembles *P. nigro-maculata* Lafr. et D'Orb. in the markings of the back and wing-coverts, but in its coloration otherwise it is quite different.

This handsome bird was obtained by James McLeannan, Esq., in compliment to whom I have named it.

Quite a considerable number of birds were collected by this gentleman, mostly along the line of the Panama railroad. It is my intention before long to give a catalogue of his collection, which contains some rare, and probably other new species, besides those described above.

XXVII.—*Description of a* NEW SPECIES *of* PUPA *from California.*

BY THE REV. J. ROWELL, of San Francisco, Cal.

(Communicated by Mr. W. Cooper.)

Read 7th January, 1861.

Pupa Californica, nov. sp.

T. rimato-subperforatâ, elongato-ovatâ, tenuiusculâ, fusco-corneâ, oblique costulato-striatâ; apice obtusâ; suturâ profundâ; anfr. 5–6 convexis, ultimo ad aperturam parum compresso; aperturâ obliquâ, suborbiculari, denticulis 4 albis armatâ; 1 valido, lamelliformi, subtorto, in pariete aperturali, 1 ad columellam, 2 prope basin, profunde immersis; perist. expansiusculo, columellari subreflexo.

Shell rimate subperforate, elongate ovate, thin, dark horn colored, with oblique rib-like striæ; apex obtuse; deep suture; with 5–6 convex whorls, the last a little compressed at the aperture; aperture oblique, suborbicular, armed with four white denticles; one lamelliform, strongly developed, slightly twisted, on the parietal wall, one on the columella, and two deeply seated within or near the base of the aperture; peristome slightly expanded, columellar margin somewhat reflected.

Long. 2½; diam. 1 mill.

Habitat.—San Francisco, California.

Remarks.—I have collected a considerable number of this species of Pupa. One other only, *P. Rowellii* Newc., has hitherto been found on the Pacific Coast of the United States.

XXVIII.—*Catalogue of a Collection of Birds, made in New Grenada, by James McLeannan, Esq., of New York, with Notes and Descriptions of New Species.* Part I.

By George N. Lawrence.

Read January 28, 1861.

The birds comprised in this catalogue were collected by James McLeannan, Esq., on the Atlantic side of the Isthmus of Panama, along the line of the Panama Railroad, from near the coast to about a central point between the two oceans. He procured only such birds as he had the opportunity to preserve when not otherwise engaged, and had no intention of making a complete collection, many kinds being seen by him which were not obtained. This is to be regretted, as among those sent are many species of much interest.

Mr. McL. took no notes, as the birds were obtained solely for his own gratification, and with no expectation that a list of them would ever be published. He states that the Falconidæ are exceedingly numerous and unsuspicious, frequently perching on the telegraph poles, and allowing an approach immediately under them without taking alarm.

Fam. FALCONIDÆ.

Subfam. POLYBORINÆ.

1. *Ibycter Americanus* (*Bodd.*).

Subfam. BUTEONINÆ.

2. *Buteo gheisbreghtii*, *Du Bus.*
3. *Buteo Pennsylvanicus* (*Wils.*).

4. **Leucopternis semiplumbeus,** sp. nov.

Entire upper plumage, with the sides of the head and neck rather light plumbeous, the feathers with dark shafts, upper tail coverts and tail black, the latter crossed at about two inches from the end with a narrow band of white, slightly tinged with rufous; there is a white spot on the inner web of the outer tail feather, about equidistant between the base of the tail and the white band; quills dark plumbeous black, with the greater portion of their inner margins from the base white, the terminal portion of the quills on the under side is plumbeous grey crossed with darker bars on the inner webs, tips dark; under plumage and inner lining of the wings white; on the chin and throat the feathers have a narrow plumbeous stripe down their centres; bill bluish black, cere orange yellow; legs and feet orange yellow; claws black.

Length 16 in.; wing 8½; tail 6; bill along ridge 1¼; tarsi 2½.

SUBFAM. MILVINÆ.

5. *Elanoides furcatus* (*Linn.*).
6. *Ictinia plumbea* (*Gm.*).

SUBFAM. ACCIPITRINÆ.

7. *Herpetotheres cachinnans* (*Linn.*).
8. *Accipiter pileatus* (*Max.*).

This specimen is not fully adult; the upper plumage is umber brown; the crown is blackish brown, showing a very decided cap; the under parts are fulvous white, without spots or stripes. It bears no resemblance to the young of *A. Cooperi*, which by some ornithologists has been considered identical with this species. See remarks, antea, p. 254.

9. *Geranospiza cærulescens* (*Vieill.*).

FAM. STRIGIDÆ.

SUBFAM. SYRNIINÆ.

10. *Syrnium perspicillatum* (*Lath.*).

FAM. CAPRIMULGIDÆ.

SUBFAM. STEATORTINÆ.

11. *Nyctibius grandis* (*Gm.*).

SUBFAM. CAPRIMULGINÆ.

12. *Nyctidromus Americanus* (*Linn.*).
13. " *Guianensis* (*Gm.*).

FAM. MOMOTIDÆ.

SUBFAM. MOMOTINÆ.

14. *Momotus Martii* (*Spix*).
15. " *Lessoni*, *Less.*
16. *Crypticus platyrhynchus* (*Leadbeater*).

FAM. TROGONIDÆ.

SUBFAM. TROGONINÆ.

17. *Trogon macroura*, *Gould.*
18. " *Massena*, *Gould.*
19. " *viridis*, *Linn.*
20. " *aurantiiventris*, *Gould.*
21. " *caligatus*, *Gould.*

FAM. BUCCONIDÆ.

SUBFAM. BUCCONINÆ.

22. *Malacoptila Panamensis*, *Lafr.*

FAM. ALCEDINIDÆ.

SUBFAM. ALCEDININÆ.

23. *Ceryle torquata* (*Linn.*).
24. " *Amazona* (*Lath.*).
25. " *inda* (*Linn.*). See Cassin, Proc. Phil. Acad. 1860, p. 133.
26. " *Americana* (*Gm.*).
27. " *superciliosa* (*Linn.*).

FAM. GALBULIDÆ.

SUBFAM. GALBULINÆ.

28. *Jacameraps grandis* (*Gm.*).

FAM. CÆREBIDÆ.

SUBFAM. CÆREBINÆ.

29. *Cœreba carneipes*, *Scl.* P. Z. S. 1859, p. 376.
30. " *lucida*, *Sclater and Salvin.* Ibis, 1859, p. 14.
31. *Dacnis cœrebicolor*, *Scl.*
32. *Certhiola luteola*, *Caban.*

FAM. TROCHILIDÆ.

SUFBAM. TROCHILINÆ.

33. *Phæthornis eurynomus* (*Less.*).
34. " *Adolphi*, *Bourc.*
35. *Heliothrix auritus* (*Gm.*).
36. " *Barroti*, *Bourc.*
37. *Heliomaster Stuartæ*, *Lawr.*, antea, p. 107.

Since describing this species, I have had an opportunity of examining seven other specimens from Bogota, in the possession of Mr. William Galbraith, Taxidermist, of this city. I find the bills of these to be quite as long as those of *H. longirostris*, but they are much stouter; and I notice some characters not mentioned in my original description, viz. the base of the bill is very broad and bare of feathers, whereas in *longirostris* the bill at the base is comparatively narrow, and the feathers extend quite forward on the bill. These differences were constant in an equal number of each species.

The specimen in this collection shows the same characters, and has the greater extent of black in the tail feathers, as have also those spoken of above.

38. *Florisuga mellivora* (*Linn.*).
39. *Thalurania venusta*, *Gould.*
40. *Amazilia Riefferi*, *Bourc.*

41. **Chlorostilbon assimilis,** sp. nov.

The entire upper plumage is of a bronzed or dull golden green; tail dark steel blue; wings brownish purple; under plumage brilliant green, golden on the abdomen and on the throat of a bluish green; under tail coverts grass green; a small white spot on the pleura; tibial feathers brown; bill and feet black.

Length 3 in.; wing 1 7/16; tail 1 1/16; bill 5/16.

This species is somewhat like *C. melanorhynchus*, Gould, but is smaller; the bill is much shorter, and comparatively weaker; the crown is uniform in color with the back, not brilliant as in *melanorhynchus*, the latter species is also more golden on the abdomen, and has the tail less forked with the feathers narrower.

42. *Erythronota Edwardi* (*Bourc. et Delatt.*).
43. *Juliamya typica*, *Bonap.* (*Ornismyia Juliæ*, *Bourc.*).
44. *Damophila amabilis*, *Gould.*

Fam. CERTHIADÆ.

Subfam. FURNARINÆ.

45. *Rhodinocichla rosea*, *Less.* ♂ and ♀.

Subfam. DENDROCOLAPTINÆ.

46. *Dendrornis guttatus* (*Licht.*).
47. " *tenuirostris* (*Licht.*).
48. " A large species which I have not been able to make out.
49. *Xiphorhynchus Lafresnayanus* (*Orb.*).

FAM. TROGLODYTIDÆ.

SUBFAM. TROGLODYTINÆ.

50. *Cyphorinus cantans* (*Gm.*).

Above rufous brown, the back crossed with narrow dark almost obsolete bars; quills narrowly barred with black on the outer webs; tail rufous brown, with narrow black bars; throat and sides of the neck bright rufous; breast ashy brown; abdomen and sides dull rufous brown; bill black; legs and feet yellowish brown.

Length 5 in.; wing 2½; tail 1¼; bill ⅘; tarsi ¾.

51. *Thryothorus nigricapillus, Scl.* ?

FAM. MNIOTILTIDÆ.

SUBFAM. MNIOTILTINÆ.

52. *Dendroica virens* (*Gm.*).

53. *Helminthophaga chrysoptera* (*Linn.*).

FAM. FORMICARIDÆ.

SUBFAM. THAMNOPHILINÆ.

54. *Cymbilanius lineatus* (*Leach*). ♂ and ♀.

55. *Thamnophilus transandeanus, Scl.* ♂ and ♀.

56. " *doliatus* (*Linn.*). ♂ and ♀.

SUBFAM. FORMICIVORINÆ.

57. *Myrmetherula Surinamensis* (*Gm.*). ♀.

SUBFAM. FORMICARINÆ.

58. *Pithys rufigularis* (*Bodd.*)?

Upper plumage rufous brown; back scarcely olivaceous; a concealed spot of white between the shoulders; sides same color as the back; tail deep rufous brown; the three outer tail feathers tipped with white;

wings umber brown edged with dull rufous, wing coverts edged with bright rufous; under plumage deep bright rufous; bill dark horn color, under mandible lighter at the end.

Length 6 in.; wing 3; tail 2⅜; bill ¾; tarsi 1.

This bird does not answer very well to the description of *P. rufigularis*, and may be distinct; it differs in having the entire under surface rufous, a little paler only on the lower part of the abdomen. *P. rufigularis*, according to Latham, has "the chin, throat, and breast rufous yellow." Mr. Sclater, P. Z. S. 1858, p. 274, describes it as being "brownish olive, paler below, with the throat rufous."

59. *Gymnocichla nudiceps*, *Cassin.*
60. *Phlogopsis McLeannani*, *Lawr.*, antea, p. 285.
61. *Pittasoma Michleri*, *Cass.* Proc. Phil. Acad. 1860, p. 189.

This is a fine specimen of this interesting new species. I had nearly completed my examination of the birds contained in this present catalogue, before I was aware that Mr. Cassin was engaged upon the collection made by Lieutenant Michler. The above bird I considered one of the most important novelties; and it was not until I compared notes with Mr. Cassin, that I found it was also in the collection he was investigating. As his paper was nearly ready for publication, and he had assigned it a name, I yielded the description of it to him.

Mr. McL. shot his specimen in high woods, where it was feeding on low shrubs in company with *Phlogopsis McLeannani.*

Fam. ANABATIDÆ.

Subfam. ANABATINÆ.

62. *Anabates cervinigularis*, *Scl.*

FAM. TYRANNIDÆ.

SUBFAM. TYRANNINÆ.

63. *Scaphorhynchus Mexicanus, Lafr.*
64. *Tyrannus intrepidus, Vieill.*
65. " *melancholicus, Vieill.*
66. *Myiarchus Panamensis, Lawr.*, antea, p. 284.
67. *Myiodynastes nobilis, Scl.* P. Z. S. 1859, p. 42.
68. *Milvulus monachus, Hartl.*
69. *Myiozetetes Cayennensis* (*Linn.*).

SUBFAM. PLATYRRHYNCHINÆ.

70. *Todirostrum cinereum* (*Linn.*).
71. *Muscivora Mexicana, Scl.*

FAM. COTINGIDÆ.

SUBFAM. TITYRINÆ.

72. *Tityra albitorques, Du Bus.*
73. " *personata, Jard. and Selby.*

74. **Pachyramphus cinnamomeus,** sp. nov.

Male. Third and fourth primaries longest and equal, first intermediate between the fifth and sixth, second abnormally shortened. Upper plumage of a bright reddish cinnamon color, a little darker on the crown; a dusky spot immediately forward of the eye, and above the spot a pale streak running to the bill; wings and tail of the same color as the back, the ends of the primaries being dark brown; under plumage pale cinnamon, nearly white on the throat; bill dark horn color, with the edges and tips of both mandibles white; legs and feet dark plumbeous.

Length 6 in.; wing 3⅛; tail 2½; bill ½; tarsi ¾.

The female is precisely like the male in plumage, but, as is usual in this family, has the second primary of full length.

This is the second instance in this genus in which the male wears the dress of the female; in all the others, with these two exceptions, the sexes are very different in color.

The species alluded to above, and which this somewhat resembles, is *P. rufescens* (Spix); but as there is no appearance of the cinereous band which extends from the hind neck on each side of the head in that species, I cannot but consider it distinct. The localities of the two species are also very different.

75. *Pachyramphus* ———. ♀.

This is colored much like the above species, but the head is darker, and the bill much smaller, being short and flat.

Length 5½ in.; wing 2⅓; tail 1⅞.

Fam. AMPELIDÆ.

Subfam. PIPRINÆ.

76. *Chiroxiphia caudata* (*Shaw*).
77. " *mentalis*, *Scl.*
78. " *vitellina*, *Gould.*
79. " *cyaneocapilla*, *Wagl.*

Subfam. GYMNODERINÆ.

80. *Querula cruenta* (*Bodd.*).

Fam. CORVIDÆ.

Subfam. GARRULINÆ.

81. *Uroleuca pileata* (*Temm.*).

Fam. STURNIDÆ.

Subfam. QUISCALINÆ.

82. *Cassidix baritus* (*Sw.*).
83. " *crassirostris* (*Sw.*)?

SUBFAM. ICTERINÆ.

84. *Ostinops Montezuma, Less.*
85. " *cristatus (Gm.).*
86. *Ocyalus Wagleri (G. R. Gray).*
87. *Cassiculus Prevosti (Less.).*
88. " *icteronotus (Vieill.).*
89. " *uropygialis (Lafr.).*
90. *Icterus mesomelas (Wagl.).*
91. " *Giraudii, Cassin.*

FAM. FRINGILLIDÆ.

SUBFAM. COCCOTHRAUSTINÆ.

92. *Cyanoloxia cyanoides (Lafr.).*
93. *Hedymeles Ludovicianus (Wils.).*

SUBFAM. TANAGRINÆ.

94. *Saltator atriceps, Less.*
95. " *magnus (Gm.).*
96. *Phœnicothraupis rubicoides (Lafr.).*
97. *Tanagra cana, Swainson.*
98. " *palmarum, Max.*
99. *Rhamphocelus icteronotus, Bonap.*
100. *Pyranga æstiva (Gm.).*
101. *Tachyphonus luctuosus, D'Orb. et Lafr.*
102. **Tachyphonus Cassinii,** sp. nov.

"*Tachyphonus?*" Cass. Proc. Phil. Acad. 1860, p. 142.
No. 62 Cat. of Michler's Collection.

Fourth quill longest, the first and ninth equal.

Male. Front, sides of the head inclosing the eyes and chin black, a triangular patch of olivaceous yellow begins at a point on the crown opposite the forward angle of the eye, and gradually widens until on the occiput it is the entire width of the head; upper plumage besides sooty black, slightly tinged with olive green; wings and tail dark sooty brown; throat dark plumbeous grey, in the centre tinged with olive green; under plumage deep olivaceous yellow, brightest on the breast, dusky on the sides, and deepening to dull reddish orange on the lower part of the abdomen and under tail coverts; upper mandible blackish horn color, the under mandible lighter towards the end; tarsi and feet blackish brown.

Length 7 in.; wing $3\frac{3}{8}$; tail 3; bill $\frac{5}{8}$; tarsi $\frac{15}{16}$.

The plumage of the female is similar to that of the male.

A single specimen in the collection puzzled me to know where to place it, as was the case with Mr. Cassin; but having received other specimens of both sexes, which I consider reliable, I have no hesitation in describing it as new, and have accordingly dedicated it to my friend Mr. Cassin.

103. *Eucometis cristatà* (*Du Bus.*).
104. *Calliste inornata*, *Gould.*

There are several specimens of this species, all alike in plumage. Mr. McLeannan considers it distinct from *C. Francescæ.* He found them breeding, the nest being placed in low trees. *C. Francescæ* builds in the Prickly Palm, a large tree.

105. *Calliste Francescæ* (*Lafr.*).
106. *Euphonia hirundinacea*, *Bp.*
107. *Arremon aurantiirostris*, *Lafr.*
108. *Pitylus grossus* (*Linn.*).

SUBFAM. EMBERIZINÆ.

109. *Euspiza Americana* (*Gm.*).
110. *Phonipara gutturalis* (*Licht.*).
111. " *pusilla* (*Sw.*).

FAM. RAMPHASTIDÆ.

SUBFAM. RAMPHASTINÆ.

112. *Rhamphastos tocard, Vieill.*
113. " *carinatus, Swain.*
114. *Pteroglossus torquatus* (*Wagl.*).

FAM. PSITTACIDÆ.

SUBFAM. ARAINÆ.

115. *Ara militaris* (*Linn.*).
116. *Psittovius tovi* (*Gm.*).

SUBFAM. PSITTACINÆ.

117. *Pionius menstruus* (*Linn.*).
118. " *hæmatotis, Scl. et Salv.?* P. Z. S. 1860, p. 300; Ibis, vol. ii. p. 401, pl. xiii.

A single specimen only is in the collection, which differs from the description and figure above cited in the feathers of the crown being without the narrow red margins, and in having a narrow collar of red feathers immediately under the dark color of the throat. In the large collection of Mr. J. G. Bell, I examined ten specimens of *P. hæmatotis* (collected by Mr. Leyland in Honduras), none of which have any trace of the collar, but all agreeing with Mr. Sclater's description. Additional specimens are required to determine whether it is merely a variety of the above species.

FAM. PICIDÆ.

SUBFAM. PICINÆ.

119. *Dryocopus Malherbii* (*G. R. Gray*). ♂ and ♀.

SUBFAM. MELANERPINÆ.

120. *Centurus Pucherani* (*Malh.*).
121. " *rubriventris, Sw.*

Fam. CAPITONIDÆ.

Subfam. CAPITONINÆ.

122. **Capito maculicoronatus**, sp. nov.

The feathers of the crown and occiput are elongated and distinctly spotted, being of a fine brown color at the base with the ends dull white, on the hind neck the feathers are wholly brown and destitute of spots; the entire upper plumage besides, together with the sides of the head and of the neck, are glossy bluish black; tail brownish black above and dark brown underneath; wings dark brown, under lining of wings and inner edges of quills pale yellow; throat silky white, becoming pale yellow on the lower part of the neck, and deepening to orange on the breast, where it forms a transverse band; abdomen pale cream-colored white, marked down each side with conspicuous heart-shaped black spots, sides under the wings black, marked on the pleura with elongated feathers of a deep orange; inside of thighs white; under tail coverts white, tinged with pale yellow; bill dark horn color, the culmen is marked just forward of the nostrils with a spot of dull orange, under part of the lower mandible dull white; legs and feet black.

Length 6⅝ in.; wing 3⅛; tail 2¼; bill ¾; tarsi ⅞.

The female, in place of the white throat and orange breast of the male, has those parts of the same lustrous black as the upper plumage; in all other markings they are precisely alike.

This species differs remarkably in color from all others of the genus.

Fam. CUCULIDÆ.

Subfam. COCCYZINÆ.

123. *Piaya nigricrissa, Scl.* P. Z. S. 1860, p. 285.
124. " *rutila* (*Vieill.*).
125. *Diplopterus excellens, Scl.* P. Z. S. 1857, p. 229.
126. *Dromococcyx Mexicanus, Bp.*

SUBFAM. CROTOPHAGINÆ.

127. *Crotophaga ani, Linn.*

FAM. COLUMBIDÆ.

SUBFAM. COLUMBINÆ.

128. *Lepidoenas speciosa* (*Gm.*).

SUBFAM. GOURINÆ.

129. *Chaemepilia rufipennis, Bp.*
130. *Peristera cinerea* (*Temm.*).

FAM. CRACIDÆ.

SUBFAM. CRACINÆ.

131. *Crax rubra, Linn.?* ♀.

FAM. TETRAONIDÆ.

SUBFAM. ODONTOPHORINÆ.

132. *Odontophorus Guianensis* (*Gm.*).

FAM. ARDEIDÆ.

SUBFAM. ARDEINÆ.

133. *Eurypyga helias* (*Pallas*).
134. *Garzetta candidissima* (*Gm.*).
135. *Butorides virescens* (*Linn.*).
136. *Tigrisoma Brasiliense* (*Linn.*).
137. *Pilherodius pileatus* (*Lath.*).

FAM. SCOLOPACIDÆ.

SUBFAM. SCOLOPACINÆ.

138. *Gallinago Wilsonii, Bp.*

FAM. PALAMEDEIDÆ.

SUBFAM. PARINÆ.

139. *Parra melanopygia, Scl.*

FAM. RALLIDÆ.

SUBFAM. RALLINÆ.

140. **Corethrura albigularis,** sp. nov.

Head above rufous brown, lores ashy; sides of the head and of the neck, hind neck, and upper part of the back bright rufous; back and wings rufous brown, rather darker than the head; rump and tail deep brown; primaries dark brown, shoulders edged with white, smaller wing coverts blackish brown barred with white, some of the other coverts ending with bright rufous; throat pure white; lower part of the neck and the breast rufous, paler than that of the hind neck with which it connects; abdomen, sides, and under tail coverts black banded with white, each feather crossed with three bars; under wing coverts white varied with black; bill blackish brown; legs and feet appear to have been flesh color.

Length to end of tail 6 in.; wing 3; bill $\frac{11}{16}$; tarsi $1\frac{1}{8}$; mid toe and claw $1\frac{1}{2}$.

This species is allied to *C. albifrons*, Sw. and *C. ruficollis*, Sw.

SUBFAM. GALLINULINÆ.

141. *Gallinula Martinica* (*Linn.*).

FAM. COLYMBIDÆ.

SUBFAM. HELIORNINÆ.

142. *Heliornis fulica* (*Bodd.*).

XXIX.—*Descriptions of Three New Species of Birds.*

By Geo. N. Lawrence. *Read April* 22, 1861.

Grallaria perspicillata,

Male. Upper part of head and hind neck dark greyish slate; back dark yellowish olive, some of the feathers marked down their centres with narrow stripes of pale orange or fulvous yellow; tail olive brown; wing coverts of the same color as the back, each feather having a spot at the end of fulvous yellow; spurious wing black with a pale orange stripe on the outer edge; primaries and secondaries blackish brown, broadly edged with rather dull rufous, brightest on the former, on the base of which, below the spurious wing, is a lighter colored spot; tertiaries olive on the outer webs, and blackish brown on the inner; lores, eyelids, and ear coverts pale orange buff or salmon color, the front half of the buff colored circle around the eye is bordered with a narrow edging of black; a black stripe extends from the lower mandible down the sides of the neck; throat white, pale yellowish orange down the side of the neck; the feathers of the upper part of the breast are of the same color as the side of the neck in their centres, with the edges broadly marked with black; on the lower part of the breast, and sides of the abdomen, the feathers are similarly edged with black, but the centres are white, giving a striped appearance to the under parts, a portion only of the lower part of the abdomen in the centre being free from stripes; the sides under the wings are olivaceous with broad stripes of dusky black; thighs and under tail coverts dull pale orange; under wing coverts deep salmon color, spotted with black near the outer edge of the wing; inner edges of primaries pale salmon color; upper mandible dark horn color, lower mandible yellowish white, dark at the end; legs and feet yellow, claws pale.

Length about 5½ in., wing 3¼; tail $1\frac{3}{16}$; bill $1\frac{1}{16}$; tarsi $\frac{5}{16}$.

Habitat.—New Grenada, Isthmus of Panama.

The female similar in plumage to the male.

In general appearance it much resembles *G. macularia*, which species has the region of the eye naked, whereas in mine these parts are fully feathered; in *macularia* the sides are plain ochraceous without stripes, the back is without the narrow fulvous markings and the wing coverts are edged with fulvous, these last in my species having their ends only marked with triangular shaped spots. The specimen of *G. macularia* in the Mus. of the Philadelphia Acad., besides the black stripe running from the bill down the side of the neck, has a second one commencing on the chin and running parallel with the other.

Polioptila superciliaris,

Male. Crown and occiput deep glossy black; lores, superciliary stripe, and ear coverts white, the extension backward of the superciliary stripe divides the black, so as to leave a narrow line of that color running back from the eye; upper plumage clear bluish grey; the two central tail feathers are black, the first outer feather is entirely white, the second white excepting a very small portion at the base, the third is black for half its length, then white to the end, the fourth is black tipped with white; quill feathers blackish brown, the primaries edged with bluish grey and the secondaries broadly margined with white; the under plumage is light plumbeous grey, paler on the throat and cheeks and nearly white on the lower part of the abdomen; the under wing coverts and the inner edges of the quills are white; bill black, the base of lower mandible light horn color; legs and feet black.

Length $3\frac{3}{4}$ in.; wing $1\frac{3}{4}$; tail $1\frac{5}{8}$; bill $\frac{7}{16}$; tarsi $\frac{9}{16}$.

Habitat.—New Grenada, Isthmus of Panama.

The female differs in having the crown of the same color as the back.

It resembles *P. bilineata;* but that species is described as being plumbeous above, white below, and having the ends only of the outer tail feathers white. The color of the back in this new species is very similar to that of *P. cærulea.*

Chlorostilbon nitens.

Front and crown golden yellowish green, very brilliant; back and wing coverts shining bronzed green, lower part of back and upper tail coverts shining grass green; under plumage brilliant green, of a bluish shade on the throat, and golden on the abdomen; tail steel blue and forked; wings brownish purple; tarsi clothed with blackish feathers; vent and pleural spot white; under tail coverts bright grass green; upper mandible black, the under yellow for two thirds its length, with the end black; feet black.

Length 3 in.; wing $1\frac{3}{4}$; tail $1\frac{1}{8}$; bill $\frac{9}{16}$.

Habitat.—Venezuela.

Allied to *C. chrysogaster*, but is smaller, and has a brilliant crown, which is not the case with *chrysogaster*, neither does the blue color of the throat exist in that species.

For the donation of this specimen I am indebted to Mr. William Galbraith, of this city, who first called my attention to it as being different from any of the small green Humming birds he had been in the habit of mounting, especially those from Bogota. I would here record my thanks to him, not only for the gift of this species, but for many disinterested favors of a similar kind, and for the liberal manner in which he has frequently brought to my notice specimens of birds he had not before met with.

Note.—In the preceding paper the genus of the species Nos. 77, 78, and 79, should be *Pipra*, and not, as printed in error, *Chiroxiphia*.

XXX.—*Notices of certain New Species of North American Salmonidæ, chiefly in the Collection of the N. W. Boundary Commission, in charge of Archibald Campbell, Esq., Commissioner of the United States, collected by Doctor C. B. R. Kennerly, Naturalist to the Commission.*

By George Suckley, M.D., Late Assistant Surgeon, U. S. Army.

Read June, 1861.

Owing to the unfortunate death of Dr. Kennerly on his return from a three years' exploration, the preparation of a report on certain of the material collected by him was assigned to me. In the course of this undertaking I have prepared a copious synopsis of the species of American Salmon and Trout, to appear in the final Report of the Commissioner. It has been thought best to issue in advance brief descriptions of the species hitherto unnamed.

Nothing is more difficult than the naming of different species of the Salmonidæ from individual peculiarities, scarcely one constant character being ever found confined to a single kind, so that in the determination of the species we are obliged to rely upon an aggregation of characters and their modifications. In many instances this difficulty has been got over readily, and in a very satisfactory manner to the author, by applying the names of gentlemen who have directly or indirectly shown their interest in aiding Dr. Kennerly in his pursuits, or the author in his preparation of this report. In this paper,—another published in the Annals of the N.Y. Lyceum,—and a report by the author on the Salmonidæ of the N. W. coast of America, printed in the 12th volume Pacific R. R. Reports, and duplicated in the "Natural History of Washington Territory," nearly everything hitherto printed relating to the species of Salmon and Trout found on the Pacific slope is embodied—with the exception of certain details contained in Sir John Richardson's Fauna Boreali Americana, and in a few other papers to be referred to in the more extended report.

Salmo Kennerlyi, Suckley.

Kennerly's Trout. Chiloweyuk Red Salmon-Trout.

Sp. Ch. *Male.* The head, measured from snout to nape, is contained about seven and a half times in the total length; when measured from the same point to extreme edge of operculum it is contained but four and three quarter times. The point of greatest depth of body corresponds to a line drawn from the back downwards, about midway between the tips of the adducted pectorals and the anterior insertion of the ventrals. The tips of the dorsal and ventrals when flattened backwards reach the same imaginary vertical line. Adipose dorsal commences at a point nearly opposite the origin of the last ray of the anal—the tips of both fins extending backward equally far. Tail strongly forked, its free margin somewhat waved. Snout somewhat turned up, the lower jaw projecting slightly beyond the upper. A single row of teeth along the anterior half of vomer. Teeth on the premaxillaries rather strong. Size of adult rarely exceeds ten or eleven inches. Body compressed laterally; its greatest depth contained four and a quarter times in total length. Dorsal outline strongly arched from the nape, the ridge being somewhat sharp. Curve of belly from origin of ventral fin to that of the last ray of the anal very sharp, from thence to the caudal the upper and lower borders of the peduncle of the tail are almost straight and parallel. General color of body red, dingy along the back, paler on the sides and fading into pure white on the belly. Small irregular black spots above the lateral line. Pectorals bluish, their tips slightly grayish. Dorsal and ventrals red. Tail spotted.

Habitat.—Chiloweyuk Lake, near Fraser River (Dr. Kennerly), Ne-hoi-al-pit-kwu R. (Gibbs.) The species is named in honor of Dr. C. B. R. Kennerly, Naturalist of the N. W. Boundary Commission, who died on his return voyage, after three years' absence exploring the wilderness.

Salmo Warreni, Suckley.

Warren's Trout.

Typical specimens 2070, 2073 in the Smithsonian Coll. Fishes.

Sp. Ch. Dorsal outline strongly arched; its convexity rising suddenly from the nape and attaining its height at a point near a line drawn perpendicular to the lateral line and touching the tips of the pectorals when flattened backwards along the sides. Head rather broad; muzzle somewhat conical; jaws equal and rounded. The eyes beneath plane of lateral line. Opercules and pre-opercules spotted with minute spots of black. Numerous stellate and irregular black spots, many of which are quite faint as if obscured by the thickness of the overlying scales; belly white; back bluish or greenish; dorsal fins and tail spotted. Scales small (but much larger than in S. fontinalis), compact and very adherent; when glistening in certain reflections giving an enamelled appearance to the fish. Tail forked.

Habitat.—Chiloweyuk Depot. Waters of Fraser River, British Columbia, Dr. Kennerly.

Named in honor of W. J. Warren, Esq., Secretary N. W. B. Commission.

Note.—The largest specimens examined by the describer were not over ten inches in length. They may have been immature individuals of a larger anadromous species; but were labelled *Trout* by Dr. Kennerly.

Salmo brevicauda, Suckley.

Short-tailed Trout.

Sp. Ch. Body long and slender; its dorsal outline from a point opposite the posterior margin of the opercula being nearly straight. Scales large; quite thin, and glistening with metallic lustre; very loosely adherent. They encroach upon the tail for nearly a third of its length, thus giving it a short appearance. The peduncle of the tail is wide for the depth of the body, and the caudal itself is somewhat short and narrow. Head long, but not deep. Dorsal and caudal fins freely spotted with oval black spots. Body marked with small stellate and irregular dark spots, their number and size varying greatly in different individuals. There are usually two rows of teeth on the vomer. The head is contained nearly five times in the total length, which rarely exceeds eighteen or twenty inches.

Habitat.—Obtained from the waters of Puget Sound and the streams in that vicinity, by Drs. Kennerly, Cooper, and Suckley.

Salmo Bairdii, Suckley.

Baird's River-Trout. Red-spotted Rocky Mountain Trout.

Sp. Ch. Head contained about five times in the total length. Snout having a deep notch between the extremities of the premaxillaries receiving a conical fleshy protuberance, projecting upwards from the chin. Teeth strong, hooked, and very uniform in size; two rows on the tongue; from two to four on the front of the vomer,—none on its shaft [in one of the specimens examined, a single accidental small tooth was found on the shaft of this bone, on the other none]. Sides of the body beautifully spotted with rose-colored spots of the size of small peas, of which there are numerous rows. Nostrils double. Tail broad, and but moderately lunated. Scales small. Anterior rays of the pectorals, ventrals, and anal broad, and the skin upon them *yellowish red*, being colored differently from the rest of the fin, as in the *S. fontinalis*. Attains a weight of ten or twelve lbs.

Habitat.—Clarke's Fork of the Columbia, and its tributaries.

Salmo Parkei, Suckley.

Parke's River Trout. *Green speckled-backed Trout.*

Aitshst of the Kootenays.

Sp. Ch. Head contained about four and a half times in the total length; its top flat; muzzle pointed. Tail forked; unspotted. Back dark-green, spotted with spots of lighter green; sides spotted with red. Scales adherent and about the size of those of *S. Bairdii.* A disposition towards the formation of a fleshy "tit" projecting upwards at the point of lower jaws, with a corresponding notch between the pre-maxillaries. Superior maxillary reaches to a point considerably behind the eye. Branchiostegals 13—14. The anterior rays of the lower fins are covered with a differently colored skin from that of the rest of the fin—as in *S. fontinalis* and *S. Bairdii.* Two teeth on the outer extremity of the vomer, behind which from one to three on the shaft.

Habitat.—Kootenay River, Rocky Mountains.

Named in honor of Lt. John G. Parke, U. S. Topog. Engineers.

Salmo hudsonicus, Suckley.

Hudson's Bay Trout.

Sp. Ch. Head contained five times in the total length of the fish. Dorsal outline strongly arched, its point of greatest height being at the first ray of the dorsal. Head small and conical. Mouth quite small. Teeth small; a few on the head of the vomer; none on its shaft. Two rows of teeth on the tongue. Tail broad, and usually barred. In some specimens the bars appear to have faded out. Upper parts dark (bluish?), sides brighter, belly white. The whole fish quite silvery. Scales small, but larger than in *S. fontinalis.* They are firmly adherent, and quite conspicuous. Flanks of adults above and below the median line covered with light spots about the size of small peas—those in alcohol appearing as if they had been of a cream or orange color during life.

Integument over first ray of pectorals of a light orange or reddish color; that over the next ray dark. Female nearly similar.

Diagnosis.—Would not be easily confounded with any Atlantic species except *S. fontinalis,*—but has smaller head, larger spots, and larger, more adherent, and thicker scales.

Habitat.—Hudson's Bay and vicinity (C. Drexler), Labrador (Elliot Cowes), Newfoundland (T. Gill).

Salmo Richardii, Suckley.

Suk-kégh Salmon.

Sp. Ch. [Based on a skin in alcohol, No. 2005, Smithsonian Cat. Fishes.] Dorsal outline moderately convex, its point of greatest height being at insertion of anterior ray of dorsal—the arch from the snout to the caudal insertion being very uniform.

Female.—Head conical: jaws apparently equal—the thick fleshy tip on the point of the lower jaw of the fresh-run fish aiding much to give this appearance. Maxillary extends back to a point immediately below the posterior margin of orbit. Teeth extremely small, and but few. Tail deeply lunated—almost forked. Caudal and other fins unspotted. Does not often attain a greater weight than fifteen pounds. Br. rays usually 14.

Habitat.—N. W. Pacific coast. Enters Fraser and Skagit Rivers.

The species is named in honor of Mr. J. H. Richard, the clever artist who has so handsomely and correctly drawn the Ichthyological illustrations of the Pacific R. R. Reports.

Salmo Cooperi, Suckley.

Sp. Ch. *Male.* Head enters nearly four and one quarter times in the total length. Back much arched, having a tendency to hump. Scales rather coarse and large. Skin thick and strong. Tail deeply lunate, profusely sprinkled with oval spots of black. Snout (premaxillaries) somewhat elongated. Dental development much like that of *S. proteus*, Pallas, but the fish differs in lacking the exaggerated hump, and in the lapping of the scales on the body. The adults rarely exceed twenty-two inches. Female of similar size. Mouth symmetrical. Back less arched; and with little tendency to "humping." Teeth developed as in the female *S. Scouleri.*

Habitat.—Anadromons, ascending the Columbia in autumn. Found extensively abundant in the Okanakani River, where it is known to the whites as the "Little Red-Salmon," and to the natives as the *Ta-ah-nia.*

Named after Dr. James G. Cooper, who has done so much towards elucidating the Natural History of the North West Coast.

Notes on Species of Salmon heretofore described.

The *Salmo canis* Suckley imperfectly described in the Annals N. Y. Lyceum, Dec. 1858, from memory, has the following additional characteristics not then given, which appear on the examination of specimens recently added to the Smithsonian Collection. A broad dilated knob on the extremity of the lower jaw upon which there are usually at least three large curved teeth on each side—the anterior being the larger. Large curved teeth on the premaxillaries: arms of the lower jaw studded with teeth of nearly uniform size and appearance. Tongue with a diverging row of four teeth on each side. Skin unspotted with speckles, but when the fish has been a few days in fresh water, blotched with large patches of dingy green and purplish red. Caudal somewhat forked, unspotted. Other fins unspotted. The mouth of the female is, as usual with this group of the salmon, more symmetrical than that of the male. Skin thick and fleshy; fin membranes, ditto. Scales quite adherent, overlapping each other about one third. The head is large, its dorsal outline nearly straight from the snout to nape. It is contained about four and a half times in the total length of the fish.

I have proposed a distinct sub-genus for the group of salmon embracing this species, the *S. Scouleri*, *S. proteus*, and *S. Cooperi*, in which the adult males have the premaxillaries considerably elongated, and the tip decurved, extending considerably beyond the extremity of the lower jaws. Upon the tip of the lower jaws there exists a knob, more or less broad, and heavily armed with strong curved teeth, as are the premaxillaries above. The type of this sub-genus (which I designate as *Oncorhynchus*) is the *Salmo Scouleri*, of Richardson.

If my separation of this group from the other salmon is considered as based on sufficiently good anatomical differences, the species above mentioned will hereafter be known as *Oncorhynchus Scouleri; Oncorhynchus Cooperi; Oncorhynchus proteus; Oncorhynchus dermatinus; Oncorhynchus consuetus;* and *Oncorhynchus canis.* In the latter species the projection of the intermaxillaries beyond the lower jaw is not so strongly marked —but the broad knob, and the heavy armature of strong teeth on both that and the premaxillaries exists.

The species of salmon described by Dr. Girard as the *Salmo spectabilis*, I am obliged to present under a new name. This is because there had already been described by Valenciennes in his *Hist. Nat. des Poissons* a species under the name of *Salar spectabilis.* I cannot recognise the genera *Salar* or *Fario*, for reasons which will be given in detail in a forthcoming monograph on the Salmonidæ. Therefore, according to my understanding of the subject, the *Salar spectabilis* Val. will become *Salmo spectabilis*, and Dr. Girard's *Salmo* will have to receive a new name, which I have accordingly imposed in honor of Archibald Campbell, Esq., the accomplished Chief of the U. S. N. W. Boundary Commission. *Salmo Campbelli*, Nob.

This species is the beautiful red-spotted salmon-trout of the North Western waters, known to the Skagit and Nisqually Indians as the *che-wah* or *che-wagh.*

For further remarks concerning this species and the *S. canis*, those interested are referred to the "Natural History of Washington Territory," published in 1860 by Baillière Brothers, New York, and to the same text appearing in the Pacific R. R. Reports, vol. xii., part 2.

XXXI.—*Notes on the Cyrena salmacida and the Cyrenella Americana of Morelet.*

By Temple Prime. Read June 24, 1861.

In 1851 Mr. Morelet, in his work on the new species of shells from Cuba and Central America, Part II., p. 26, gave descriptions of the above two species, to which I would beg to call the attention of conchologists.

The *C. salmacida* is a representative of that class of Cyrenæ which, differing from the rest of the species of this genus which live in fresh water, inhabits brackish waters at the outlet of rivers into the sea.

The *C. maritima* C. B. Adams, and the *C. Cubensis* Prime are as yet the only other species of this group known to us; but it is not improbable that when researches shall have been extended this number will be increased.

The discovery of Cyrenæ in brackish water is a fact of some importance to geologists, which was duly appreciated by the late Mr. D'Orbigny in one of his works.

The *Cyrenella Americana*, I will remark, is the first species of the genus which has been found on this continent.

The Cyrenellæ were at first presumed to be confined to Africa. Mr. Cuming, however, some years since, brought home several species from the Philippines. Mr. Deshayes, in 1853, described a fossil one, the *Cyrenella lucinoides*, from the basin of Paris, but he has since seen cause to refer it to the genus Diplodonta.

The *C. salmacida* and *C. Americana* are very rare shells. Mr. Cuming has one of the former in his cabinet; but, with that exception, Mr. Morelet is, I believe, the only person who has specimens of them.

In order to make these species better known, I have thought it would not be amiss to append a copy of Mr. Morelet's description of them, accompanied by drawings, which I have been enabled to procure through his kindness.

CYRENA SALMACIDA, MORELET. (Plate VI., f. 1, a. b.)
Morelet. Test. nov. Ins. Cub., pt. 2, p. 26, 1851.

T. inæquilatera, ovalis, anterius rotundata, latere postico productiore, subrostrato, transversim tenuiter sulcata, albescens vel carnea, stramineo vel cærulo nebulosa, umbonibus fulva rubellis et fascia late diluta concolore circumdata. Cardo strictus; dentes apiciales 3 minuti; laterales 2 elongati, tenues.

Long. 27; altit. 19 mill.

Testas inanes absque epidermide in paludibus maritimis circa portum Sisalesem legi.

***CYRENELLA AMERICANA, MORELET.** (Plate VI., f. 2. a. b.)
Cyrenoïdes americanus, Morelet.

T. suborbicularis, tenuis, minute striata, epidermide decidua griseo-straminea induta, intus albida; umbone antico; dens cardinalis, apicialis, lamellæformis, in utraque valvula duplex.

Long. 11½; altit. 11 mill.

Habitat.—Insulam Pinorum in paludibus.

XXXII.—*Catalogue of a Collection of Birds, made in New Grenada, by James McLeannan, Esq., of New York, with Notes and Descriptions of New Species.* Part II.

BY GEORGE N. LAWRENCE.

Read May 27, 1861.

(Continued from page 302.)

THE present part of this Catalogue is the result of a second collection of birds made during the past winter, along the line of the Panama Rail Road, by James McLeannan, Esq., with the assistance of Mr. John R. Galbraith, an intelligent and

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* Owing to an error on the part of the draughtsman, this species is represented in the plate with lateral teeth, which is incorrect.

skilful young Taxidermist, of this city. I arranged with them to receive their collections, which were to comprise all the species it was in their power to obtain, and in as many cases as possible to procure both the male and female, the sex to be ascertained by dissection. They were also to make any observations they thought would be of interest as regards habits, rarity, &c. The notes, distinguished by quotation marks, were made by Mr. Galbraith.

These gentlemen appear to have faithfully fulfilled their commission, and forwarded altogether nearly three hundred species; in most cases both sexes were procured; many of those sent are comprised in Part I. of this catalogue, and consequently are omitted in this, except in cases where further information concerning them can be given.

A few only of those enumerated in Part I. were not obtained.

The greater part of this collection was made on the Atlantic side of the Isthmus, as the investigation of this section occupied their time until the season was too far advanced to enable them to procure many species on the western slope, and in the vicinity of Panama. All are from the Atlantic slope, with the exception of Nos. 145, 174, 194, 277, 281, and 282.

FAM. FALCONIDÆ.

SUBFAM. AQUILINÆ.

143. *Spizaëtus tyrannus* (*Max.*). ♂ and ♀.
144. *Urubitinga zonura* (*Shaw*). ♀.
145. " *anthracina* (*Nitsch.*). ♂.

SUBFAM. BUTEONINÆ.

146. *Asturina nitida* (*Lath.*). ♂ and ♀.
147. " *magnirostris* (*Gm.*). ♀ and ♂.

"Irides brown; frequents the railroad track, and sits on the telegraph poles; very gentle."

SUBFAM. ACCIPITRINÆ.

148. *Micrastur gilvicollis* (*Vieill.*). ♂ and ♀.
149. " *poliogaster* (*Temm.*)? ♂.

The upper plumage is slate black; the tail is black, crossed with three white bars freckled with brown; the under plumage is of a buffy cream color; legs yellow.

Length 17¼ in.; wing 9¼; tail 8; tarsi 3.

There is a specimen in the Museum of the Philadelphia Academy precisely in the plumage of mine, which is marked *M. poliogaster* with a ?. In Temminck's figure, Pl. Col. 264, the under plumage is of a uniform grey; with this exception, they agree with his plate; both specimens appear to be fully adult.

SUBFAM. FALCONINÆ.

150. *Harpagus bidentatus* (*Lath.*).

SUBFAM. MILVINÆ.

151. *Cymindis Cayennensis* (*Gm.*).

SUBFAM. CIRCINÆ.

152. *Circus Hudsonicus* (*Linn.*).

FAM. STRIGIDÆ.

SUBFAM. SYRNIINÆ.

153. *Syrnium virgatum*, *Cass.*

FAM. HIRUNDINIDÆ.

SUBFAM. HIRUNDININÆ.

154. *Hirundo horreorum*, *Barton.*
155. *Petrochelidon lunifrons* (*Say.*).
156. " *leucoptera* (*Gm.*).
157. *Cotyle flavigastra* (*Vieill.*). ♂ and ♀.

These specimens are smaller than some I have from Cayenne; the wings are much shorter, those of the male being ½ an inch and of the female nearly an inch less; the upper tail coverts are grey, not so in my examples from Cayenne, and the colors generally are darker.

158. *Progne chalybea* (*Gm.*).

Fam. MOMOTIDÆ.

Subfam. MOMOTINÆ.

159. *Momotus subrufescens*, *Scl.* ♂ and ♀.

"Irides red; found in very retired places in the jungle; feed on insects and lizards; not plentiful."

Fam. BUCCONIDÆ.

Subfam. BUCCONINÆ.

160. *Bucco Dysoni*, *Scl.* ♂ and ♀.
161. " *tectus*, *Bodd.* ♂ and ♀.
162. *Malacoptila frontalis*, *Scl.* ♂ and ♀.

Fam. ALCEDINIDÆ.

Subfam. ALCEDININÆ.

163. *Ceryle alcyon* (*Linn.*).

Fam. CŒREBIDÆ.

Subfam. CŒREBINÆ.

164. Cœreba carneipes, Scl. No. 29 of Part I.

"Irides brown; habits very much like the Warblers of the States; is found very often in large flocks, in which the males predominate; frequent both high and low trees; have never heard any song, but they make a chirping noise while feeding."

165. Cœreba lucida, Scl. and Salv. No. 30 of Part I.

"Irides brown; habits similar to the preceding species, but never found in company with them."

166. *Dacnis.* ——— ♀.
167. *Chlorophanes atricapilla* (*Vieill.*). ♂ and ♀.

"Irides red; not common, found in open places; no song."

FAM. TROCHILIDÆ.

SUBFAM. TROCHILINÆ.

168. *Glaucis hirsutus* (*Gm.*).
169. " *Ruckeri* (*Bourc.*). ♂.

"Irides brown; always seen in retired places in the forest; not common."

170. *Phæthornis longirostris*, *Delatt.* ♂ and ♀.

"Irides brown; found in dense forests; very common."

171. *Campylopterus Cuvieri* (*Bourc.*) ♂ and ♀.

"Irides brown; get their food from the blossoms of a large tree; not abundant."

172. *Lampornis mango* (*Linn.*).
173. *Hypuroptila Buffoni* (*Less.*). ♂ and ♀.

"Irides reddish brown; very common near the 'summit.'"

174. *Sapphironia cæruleogularis*, *Gould.*
175. *Chlorostilbon* ——— ♀.
176. *Gouldia Conversi* (*Bourc.*). ♂ juv.

"Irides brown; but one seen, which was found in a dense forest."

FAM. ANABATIDÆ.

SUBFAM. ANABATINÆ.

177. *Anabates ochrolæmus*, *Tsch.?*
178. *Syanallaxis brunneicaudalis*, *Scl.* ♂ and ♀.

"Irides brown; quite common; found in low bushes and weeds very close to the ground; has no song."

179. *Xenops Mexicanus, Scl.* ♂ and ♀.

SUBFAM. DENDROCOLAPTINÆ.

180. *Dendrocolaptes Sancti Thomæ* (*Lafr.*).
181. *Glyphorhynchus cuneatus* (*Licht.*). ♂ and ♀.
182. *Dendrocincla fumigata* (*Licht.*)?
183. " ——— ♂. (undetermined.)
184. *Scleurus caudacutus* (*Vieill.*).

FAM. TROGLODYTIDÆ.

SUBFAM. TROGLODYTINÆ.

185. *Cyphorinus bambla* (*Bodd.*)? ♀.

"Irides brown; shot on the ground in the jungle; only one seen."

186. *Cyphorinus fasciatoventris, Lafr.* ♂ and ♀.
187. " *leucostictus, Caban.*
188. *Troglodytes hypaëdon, Scl.* P. Z. S. 1861, p. 128.

"Irides brown; habits same as the House Wren of the States, and song very similar."

189. *Thryothorus rutilus, Vieill.*

"Irides brown; found only in the jungle; very rare."

190. *Thryothorus longirostris, Vieill.*
191. " *leucotis, Lafr.*

192. **Thryothorus Galbraithii,** sp. nov.

Male. Upper plumage light rufous-brown, lower part of back and upper tail coverts dull rufous, brightest on the latter, which are crossed with dusky bars; there are also some nearly obsolete dusky bars on the back; tail brownish rufous, distinctly crossed with ten rather broad bars of black; quills brownish-black on the inner webs, the outer webs marked with alternate bars of black and dull rufous; wing coverts of the same color as the back faintly barred with black; lores, superciliary stripe, and ear coverts white; a line of brown extends back from the eye over the ear coverts; chin and upper part of throat pure white; entire under plumage besides rufous, paler on the throat and becoming deeper on the lower part of the abdomen and under tail coverts, the latter being quite deep in color; there are no bars on the under plumage; the under surface of the tail is barred in the same manner as the upper, but the rufous is paler and duller; upper mandible dark brown, with the edges and also the under mandible whitish horn color; irides brown; legs and feet black.

Length 5¾ in.; wing 2⅝; tail 1¾: bill ⅝; tarsi ⅞.

Female similar in plumage, but a little smaller.

Named in compliment to Mr. John R. Galbraith.

This species is about the size and in the color of the under plumage resembles *T. Ludovicianus* and *T. Berlandieri*, but the color is much deeper, and without the bars on the sides and under tail coverts, which prevail in both those species; the bars on the tail and wings are much more distinct, darker, and wider apart.

193. **Thryothorus castaneus**, sp. nov.

Thryothorus nigricapillus, *Nob. nec. Scl.* No. 51 of Part I.

Male. Head above glossy black, this color including the occiput and sides of the neck, connecting with the latter is a stripe of the same color running from the chin; cheeks and ear coverts white intermixed with black; lores greyish white; superciliary stripe and eyelids white; chin and upper part of throat white; the entire upper and under plumage besides deep reddish chesnut, paler on the breast and middle of abdomen, which are crossed with interrupted black bars; the sides and under tail coverts are more distinctly barred; upper tail coverts obscurely barred with black; tail black, with narrow rufous bars crossing the central feathers and the outer webs of the others; quills blackish brown, the outer webs and the larger wing coverts crossed alternately with rufous and black; the smaller wing coverts are of the same color as the back; upper mandible black, lower pale plumbeous; irides brown; tarsi and feet black.

Length 5¾ in.; wing 2¾; tail 2¼; bill $\frac{13}{16}$; tarsi 1.

Female precisely like the male, but smaller.

This species was put in Part I. as *T. nigricapillus*, *Scl.* with some doubt as to its correctness; but as the measurements are different, and Mr. Sclater (P. Z. S. 1860, p. 291) states that more mature examples have the whole throat and breast pure white, I consider them to be distinct.

FAM. MOTACILLIDÆ.

SUBFAM. MOTACILLINÆ.

194. *Anthus rufus* (*Gm.*). ♂ and ♀.

"Irides brown; found on the Savannahs near Panama, build their nests on the ground; the male will ascend above the nest, and remain singing in the air for a long time."

From its habits it would seem to resemble the genus *Neocorys*, *Scl.*, and possibly should be placed there.

FAM. PARIDÆ.

SUBFAM. POLIOPTILINÆ.

195. *Polioptila superciliaris*, *Lawr.*, antea, p. 304.

FAM. MNIOTILTIDÆ.

SUBFAM. SEIURINÆ.

196. *Seiurus Noveboracensis* (*Gm.*)

SUBFAM. MNIOTILTINÆ.

197. *Mniotilta varia* (*Linn.*).
198. *Geothlypis Philadelphia* (*Wils.*). ♂ and ♀.
199. *Helminthophaga peregrina* (*Wils.*).
200. *Dendroeca castanea* (*Wils.*).
201. " *Pennsylvanica* (*Linn.*).
202. " *æstiva* (*Gm.*).
203. " *maculosa* (*Gm.*).
204. " *cœrulea* (*Wils.*).
205. *Setophaga ruticilla* (*Linn.*).
206. *Basileuterus Delattrei*, *Bp.*
207. " *semicervinus*, *Scl.?* P. Z. S. 1860, p. 84.

Agrees in markings with Mr. Sclater's species, but differs from it somewhat in measurements.

The length is 5¾ in.; wing 2½; tail 2.

"Irides brown; always found on the banks of a brook, close to the water, and in very retired places in the forest; not common."

Fam. VIREONIDÆ.

Subfam. VIREONINÆ.

208. *Vireo flavifrons, Vieill.*

209. *Vireosylvia flavoviridis, Cass.*

210. **Hylophilus pusillus,** sp. nov.

The fourth and fifth primaries are equal and longest, the second is shorter than the ninth, the first or spurious primary is about half the length of the second.

The upper part of the head and hind neck are greyish olive, the feathers being dull plumbeous with the ends yellowish olive; the cap obscurely defined; lores dull grey, there is no superciliary stripe; upper plumage yellowish green; tail greenish olive, the outer webs are brighter and the inner webs are margined with pale yellow; quills blackish brown, the outer edges are of the same color as the back, except the margins of the outer primaries, which are white; throat and sides of the neck greyish white; sides and under tail coverts yellowish green like the back, breast pale yellow, abdomen nearly white; under wing coverts and inner edges of quill feathers pale yellow; upper mandible brown, under mandible whitish; irides brown; legs and feet plumbeous.

Length 3½ in.; wing 2; tail 1¼; bill $\frac{7}{16}$; tarsi $\frac{9}{16}$.

Male and female alike in plumage.

This species resembles *H. plumbiceps, Scl.*, but is smaller; it differs in having the cap rather indistinct and mixed with olivaceous, whereas in the other the cap is strongly defined, of a clear plumbeous grey, this color extending further down than in my species, so as to occupy the upper part of the back; the color of the present bird above is more yellow and the under parts whiter, the yellowish green color being paler and more restricted to the sides under the wings; the color of the tail underneath is brighter.

211. **Hylophilus aurantiifrons,** sp. nov.

Male. Fourth quill longest, second and eighth equal, the first primary three fifths the length of the second.

Front yellowish orange, top and hind part of head cinereous with a tinge of buff, sides of the head pale reddish buff; upper plumage yellowish green, brightest on the uropygium and upper tail coverts; tail olive green narrowly edged with pale yellow on the inner webs; quills dusky brown broadly margined with yellowish green; under plumage entirely pale yellow, brightest on the under tail coverts, and nearly white on the throat; under wing coverts and inner edges of quills pale yellow; upper mandible light brown, the lower whitish horn color; irides brown; legs and feet light brown, claws brownish white.

Length 4¼ in.; wing 2⅛; tail 1¾; bill ½; tarsi ⅝.

In this species the cap is obscured and of a rather peculiar color, which together with the orange yellow front and uniform pale yellow under plumage, form good distinguishing characters. Only one specimen was obtained.

212. **Hylophilus viridiflavus,** sp. nov.

Female. Fourth quill longest, second shorter than eighth, the first about two thirds the length of the second.

Entire upper plumage bright olive green; tail olive green with the outer margins of the feathers brighter, and the inner margins yellow; quills dark brown edged with olive green; chin, upper part of throat, and ear coverts ashy; under plumage bright yellow; under wing coverts and inner edges of quills bright yellow; bill brownish yellow; irides white; legs and feet pale flesh color, claws white.

Length 4½ in.; wing 2⅛; tail 2; bill $\frac{7}{16}$; tarsi ¾.

The outer secondaries are nearly as long as the primaries, and the tail is relatively longer than in the preceding species.

"Rare; but one obtained, which was found in the jungle."

FAM. FORMICARIDÆ.

SUBFAM. THAMNOPHILINÆ.

213. *Thamnophilus Amazonicus, Scl.* ♂ and ♀.

"Irides brown; found in the low trees and bushes; not common."

SUBFAM. FORMICIVORINÆ.

214. *Myrmetherula pygmea* (*Gm.*). ♂.
215. " ——— ♂ and ♀.

A species I cannot make out; resembles *M. gularis*, but is ochraceous below, not cinereous, and has a longer tail.

216. *Myrmetherula.* ♀.
217. *Formicivora quixensis* (*Corn.*). ♂ and ♀.

"Irides brown; quite solitary, found on bushes and low trees; no song."

218. *Pyriglena maculicaudus, Scl.?* ♂.

Agrees in markings with Mr. Sclater's species, but is rather arger.

219. *Myrmeciza exsul, Scl.* ♂ and ♀.

The male and female are alike.

"Irides brown; found in thick jungle and near the ground; has quite a song."

220. *Myrmeciza longipes* (*Vieill.*). ♂ and ♀.

"Irides red; always found on the ground in the jungle; appears to feed on ants."

221. *Hypocnemis schistacea, Scl.* ♂ and ♀.

"Irides brown; quite common; found in solitary places."

The under plumage of the female is of a bright not very deep rufous.

222. *Hypocnemis nævoides* (*Lafr.*). ♂ and ♀.
223. " ——— ♂. (undetermined.)

Subfam. FORMICARINÆ.

224. *Pithys leucaspis*, *Scl.* ♂ and ♀.

Crown not so red and sides more olivaceous than Bogota specimens.

225. *Formicarius analis* (*D'Orb. et Lafr.*). ♂ and ♀.

"Irides brown; shot in dense jungle and on the ground; when stepping it carries the tail almost erect."

226. *Grallaria perspicillata*, *Lawr.*, antea, p. 303.

"Quite solitary, found in the dense woods and jungle, always seen on the ground; not common; has no song."

227. Pittasoma Michleri, Cass. No. 61 of Part I.

Messrs. McL. and G. obtained but a single specimen of this species, which is a female, and differs somewhat in plumage from the male described by Mr. Cassin. It is rather smaller and has the upper plumage precisely like it, but is without the black throat, the feathers of the upper part of which are white at the base, then crossed with black, and terminating in bright chesnut; the under plumage is similarly marked with that of the male, but shows more white in consequence of the subterminal black bands on each feather being narrower."

"Irides brown; shot on the ground, appears to feed on ants; found in retired places in the forest; very rare."

Fam. TURDIDÆ.

Subfam. TURDINÆ.

228. *Turdus fuscescens*, *Steph.*
229. " *casius*, *Bp.* ♂ and ♀.

"Irides brown; very common; habits much like the song Thrush of the States; the best songster on the Isthmus."

This species is of the same size and in its general appearance much like *T. Grayii*, but is quite distinct. The color above inclines more to brown, that of *Grayii* to olivaceous; in the latter species the abdomen is much paler and the under wing coverts very much brighter; the bill of *casius* is shorter, broader at the base, and yellow at the end for half its length.

The above comparison is made with specimens from Gautemala, which I take to be the true *T. Grayii.*

FAM. TYRANNIDÆ.

SUBFAM. ATTILINÆ.

230. *Attila spadicea* (*Gm.*). ? ♀.

"Irides brown; very rare."

SUBFAM. ALECTURINÆ.

231. *Copurus leuconotus*, *Lafr.* ♂ and ♀.

SUBFAM. TYRANNINÆ,

232. *Pitangus lictor* (*Licht.*). ♂ and ♀.
233. *Myiarchus crinitus* (*Linn.*).
234. " *nigriceps*, *Scl.* ? ♀.

"Irides brown; quite rare."

This is smaller than the dimensions given of Mr. Sclater's species, and the colors differ so materially from his description, that I am inclined to consider it distinct; he describes the top of the head as black, which in the present bird is a rich deep brown; the wings and tail in this are also brown, not blackish as in the other; he describes the throat and breast as being cinereous, this color in mine does not extend on the breast. Should they prove different on comparison, it may be distinguished by the name of *M. brunneiceps.*

It measures in length 5¼ in.; wing 2⅞; tail 2⅝.

235. *Empidonax brachytarsus*, *Scl.*
236. " *Bairdii*, *Scl.* ♂ and ♀.

237. *Myiobius barbatus* (*Gm.*) ♂ and ♀.
238. " *cinnamomeus* (*Lafr. et D'Orb.*).? ♂ and ♀.

"Irides brown; not common; only three seen."

239. *Tyrannula flaviventris.* ♂.

"Irides brown; found on high trees, and very rare."
Agrees with a specimen so labelled in the Museum of the Philadelphia Academy from Cayenne, no authority given.

240. *Legatus variegatus*, *Scl.* ? ♂ and ♀.

"Irides brown; but one pair seen; feed on insects."

241. *Myiozetetes Columbianus*, *Cab. & Hein.* ♂ and ♀.

"Irides brown; very common, found on the telegraph wires in pairs; has a loud call."

242. *Elainia placens*, *Scl.* ♂ and ♀.

"Irides brown; rare, found in thick jungle; feeds on insects."

243. *Elainia subpagana*, *Scl.* ♂ and ♀.

"Irides brown; not common; found on high trees; crest always erect."

244. *Leptopogon amaurocephalus*, *Cab.* ♂.
245. *Mionectes striaticollis*, *Lafr. et D'Orb.* ♀.

"Irides brown; found on high trees; has no song."

246. *Mionectes assimilis*, *Scl.* ? ♂ and ♀.

The dimensions smaller than given by Mr. Sclater; it agrees pretty well in coloration; the tail however is olivaceous, and the color above bright olive green. A specimen of the same species is in the Museum of the Philadelphia Academy, labelled *M. olivaceus*, *Licht.*, to which I can find no reference.

Length $4\frac{3}{4}$ in.; wing $2\frac{7}{16}$; tail $1\frac{7}{8}$; bill from rictus $\frac{9}{16}$.

SUBFAM. PLATYRHYNCHINÆ.

247. **Muscivora Mexicana, Scl.** No. 71 of Part I.

"Irides brown; not abundant, very solitary, often found close to the bank of some mountain stream; builds a hanging nest, which is always suspended over a brook, and lays two eggs; has a shrill loud call, much like that of the Great Crested Flycatcher of the States."

Mr. Galbraith states that the crest is not shown when the bird is at rest, only when fighting with another male, and after being wounded and taken in the hand, when it is beautifully expanded.

The nest, which is placed in very secluded spots, is surrounded with a mass of loose straggling material; when first observed he had no suspicion of its being a bird's nest, but discovered it to be so by seeing the bird enter; inside of the loose grass, &c., is a curious hanging structure, about three feet in length, large in the centre and decreasing in size towards each end; the entrance is on the side at the largest diameter, where the nest proper is placed, this is very perfect in form; the number of eggs invariably found was two. As I am not aware that a description of the egg has been given, I have thought it best to add one.

The eggs appear small for the size of the bird; they measure, axis $\frac{13}{16}$ in., diameter $\frac{10}{16}$; the ground color is of a dull pale reddish white, marked for half the length with dull reddish brown lighter at the end, which gives the appearance of a confused broad belt just back of the largest diameter; the smaller end is irregularly spotted and streaked with the same dark color.

Messrs. McL. and G. kept a young bird for several days, which fed freely on bread, &c., and there was a good prospect of raising it, but it was killed and eaten up by ants.

248. *Cyclorhynchus brevirostris, Cab.?* ♀.
249. " *cinereiceps, Scl.* ♂.

250. *Platyrhyncha cancroma, Licht.* ♂.
251. *Todirostrum nigriceps, Scl.* ♂ and ♀.
252. " *megacephalum, Sw.* ♂.

FAM. COTINGIDÆ.

SUBFAM. TITYRINÆ.

253. *Pachyrhamphus marginatus* (*Licht.*). ? ♂.

Crown black, with the ends of the feathers glossy; interscapulary region black, lower part of back and rump bluish cinereous tinged with yellow; under plumage plumbeous grey, lighter on the abdomen; front and lords of the same color.

Length 6 in.; wing 2¾; tail 2½.

254. *Pachyrhamphus cinereus* (*Bodd.*). ? ♂.

Length 5¼ in.; wing 2⅞; tail 2½.

Rather larger than a specimen from Cayenne (which I suppose to be this species), and the coloring both above and below more plumbeous; the under wing coverts and inner margins of quills are pale yellowish white, which in the Cayenne specimen are pale reddish buff; the Cayenne bird is more tinged with yellow on the breast and back.

SUBFAM. QUERULINÆ.

255. *Lipaugus unirufus, Scl.* ♂ and ♀.

"Irides brown; found in retired places on high trees."

256. *Lipaugus holerythrus, Scl.* ♂.

"Irides brown; found in the jungle; very solitary."

257. *Lipaugus rufescens, Scl.* ? ♂ and ♀.

"Irides brown; not common; found in dense forests."

FAM. ICTERIDÆ.

SUBFAM. ICTERINÆ.

258. *Icterus Baltimore* (*Linn.*).
259. " *spurius* (*Linn.*).

FAM. TANAGRIDÆ.

SUBFAM. TANAGRINÆ.

260. *Saltator striatipectus*, *Lafr.* ♂ and ♀.

"Irides brown; very common; feeds on low trees and bushes; has a short song."

261. *Tachyphonus melaleucus* (*Sparm.*) ♂ and ♀.

"Irides brown; very plentiful; has no song."

262. *Tachyphonus xanthopigius*, *Scl.* ♂.

"Irides reddish brown; quite rare."

263. *Tachyphonus Delattrii*, *Lafr.* ♂ and ♀.

"Irides of male red, of female brown; not common; very solitary, and has no song."

264. *Pyranga rubra*, *Vieill.*
265. *Ramphocelus dimidiatus*, *Lafr.* ♂ and ♀.
266. " *luciana*, *Lafr.* ♂ and ♀.

A fine pair of this rare species was obtained; in the distribution of colors it is very similar to *R. dimidiatus*, but the head and back are black, with the hind part and sides of the neck deep maroon color; the red is of a very different shade from the other species, being of a deep flame color, not crimson. The female differs still more; in the present species the head and back are of a dull yellowish olive, with the feathers dusky in their centres; the breast, abdomen, lower part of back, and upper tail coverts are dull rather pale orange, brightest on the rump.

267. *Calliste gyroloides* (*Lafr.*).
268. " Francescæ (Lafr.). juv. No. 105 of Part I.

"Irides brown; found in cleared places; feed on low trees and bushes; always in pairs and quite common; no song. The young one was shot with the two old birds."

As some doubt has existed of the distinctness of *C. ornata* from this species, I requested the collectors to get such evidence as they could in relation to it. The procuration of this young specimen of *C. Francescæ*, which bears no resemblance to *C. ornata*, I consider as fully establishing the specific validity of the latter.

It shows the marks of the parent birds in its upper plumage, but in very dull colors; the head and lower part of the back are dull green, the upper part of the back is dusky black, behind the eye a few blue feathers are apparent, and on the sides of the head the buff color is just coming in; the throat and breast are ashy, the abdomen whitish tinged with ochraceous; the blue shoulder spot is just appearing intermixed with green.

In *C. ornata* the shoulder mark is of a much deeper and more uniform blue than in the adult of *C. Francescæ*, in which species the ends of the smaller wing coverts are pale verditer green.

269. *Euphonia Gouldii*, *Scl.* ♂ and ♀.
270. " *minuta*, *Cab.* ♂ and ♀.

FAM. FRINGILLIDÆ.

SUBFAM. FRINGILLINÆ.

271. *Chrysomitris Mexicanus*, *Sw.* ♂ and ♀.

SUBFAM. EMBERIZINÆ.

272. *Embernagra conirostris* (*Bp.*). ♂ and ♀.
273. *Volatinia jacarina* (*Linn.*). ♂ and ♀.

Subfam. PHYRRULINÆ.

274. *Oryzoborus æthiops, Scl.* ♂ and ♀.
275. *Spermophila minuta (Linn.).* ♂ and ♀.
276. " *aurita, Bp.?* ♂ and ♀.

Fam. PSITTACIDÆ.

Subfam. ARAINÆ.

277. *Conurus pertinax (Linn.).?* ♂ and ♀.

The specimens of this species in the Museum of the Philadelphia Academy have the yellow color on the sides of the head diffused; in mine there is a distinct oblong yellow spot under the eye.

Fam. PICIDÆ.

Subfam. PICINÆ.

278. *Dryocopus scapularis, Vig.* ♂ and ♀.

Subfam. PICUMNINÆ.

279. *Picumnis Grenadensis, Lafr.* ♂ and ♀.

Fam. COLUMBIDÆ.

Subfam. COLUMBINÆ.

280. *Chloroenas vinacea (Temm.).* ♂ and ♀.
281. " *rufina (Temm.).* ♂.

Subfam. GOURINÆ.

282. *Chamaepelia granatina, Bp.* ♂.
283. *Leptoptila Verreauxi, Bp.* ♂ and ♀.

Fam. CRACIDÆ.

Subfam. PENELOPINÆ.

284. *Ortalida poliocephala, Wagl.* ♂ and ♀.

Fam. TINAMIDÆ.

Subfam. TINAMINÆ,

285 *Tinamus pileatus*, *Bodd.* ♂. (*Soui*, *Gm.*).

"Irides very light brown; found in the jungle and always on the ground; when in confinement will eat corn and rice; very common."

Fam. CHARADRIADÆ.

Subfam. CHARADRINÆ.

286. *Aegialitis Azaræ* (*Temm.*). ♂ and ♀.

Fam. ARDEIDÆ.

Subfam. ARDEINÆ.

287. *Florida cærulea* (*Linn.*).

Fam. TANTALIDÆ.

Subfam. TANTALINÆ.

288. *Tantalus loculator* (*Linn.*).

Fam. SCOLOPACIDÆ.

Subfam. TOTANINÆ.

289. *Rhynchophilus solitarius* (*Wils.*).
290. *Gambetta flavipes* (*Gm.*).
291. *Tringoides macularius* (*Linn.*).
292. *Actiturus Bartramius* (*Wils.*).

Subfam. TRINGINÆ.

293. *Tringa Wilsonii*, *Nutt.*

Fam. COLYMBIDÆ.

Subfam. PODICIPINÆ.

294. *Podiceps Dominicus* (*Linn.*).

XXXIII.—*On the Geographical Distribution of the Genera and Species of Land Shells of the West India Islands; with a Catalogue of the Species of each Island.*

By Thomas Bland.

Read, June 17, 1861.

The researches carried on, especially during the last fifteen years, have developed the extraordinary richness in *Land Shells* of the West India Islands. To the late Professor C. B. Adams belongs to a great extent the merit of directing the attention of Naturalists to the subject, and it has, since the result of his first visit to Jamaica was published, been zealously followed up.

The West Indies consist of a curvilinear chain of islands extending in a south-east and then southerly direction from the coast of Florida in North America, to the Gulf of Paria, on the east coast of Venezuela in South America. The portion of the Atlantic Ocean, in a manner inclosed by these islands and the shores of the adjacent continents, is divided into two great basins—the Gulf of Mexico and the Caribbean Sea. The former is separated to a considerable extent from the latter by the Island of Cuba, the western end of which lies about midway between Florida and the peninsula of Yucatan; the distance from the island to Florida being about 140, and to Yucatan about 120 miles. The Gulf of Mexico is about 1000 miles long, and has an average width of 650, or thereabouts. The Caribbean Sea is in length 1400, and in width at the narrowest part about 400 miles.

The islands are divided into three groups, viz. the Bahamas, the Great Antilles (Cuba, Jamaica, Hayti, and Porto Rico), and the Lesser Antilles; the area of the first group is estimated to be 5,424, of the second 75,638, and of the last, 4,961 square miles. Of the great Antilles, Cuba, with the Isle of Pines, contains 43,412, Jamaica 4,256, and Porto Rico 2,970 square miles; the area of Hayti is said to be about 25,000 square miles. The area of the whole, including the Bermuda group, and also Curaçao and Buen Ayre, being less than that of England, with Wales and Scotland.

The Bermudas are situate in the Atlantic Ocean, 580 miles E. by S. from Cape Hatteras, and 645 miles N. E. from the nearest point of the Bahamas.

Looking cursorily at a map, the idea is suggested that the West Indies formed at some period a part of the adjacent continents, but there is no conclusive, if indeed any evidence of the fact.

The depth of the basin in which the waters of the Gulf of Mexico are held is very great: on the north side of Cuba, within five miles of the shore near Havana, there is an abrupt descent to the bottom of nearly a mile! Still greater depths exist in the Caribbean Sea. The islands, in fact, stand as pinnacles resting on the solid crust of the earth in the watery abyss. There is evidence to show, that the last important geological movement of the greater number, if not of all the islands, and of the adjacent parts of the contiguous continents, was of an elevatory character. The geological changes, indeed, which have occurred since the islands can have formed part of any continent, must have been enormous.

Humboldt (*Cosmos*, v. p. 421) remarks on the parallelism of the volcanic fissure extending from south to north through the islands of St. Vincent, St. Lucia, Martinique, and Guadaloupe, with that of Central America, and also on the intersection of a great basin of which, in his view, the Gulf of Mexico and Caribbean Sea form a part, by the plutonic mountain chain ranging from west to east, from Cape Catoche in Yucatan, through Cuba, Haiti, and Porto Rico to Tortola and Virgin Gorda, parallel with the granite and gneiss chain of Caraccas.

The mountains in Cuba, Jamaica, and Hayti, attain a height of from 7,000 to 8,000 feet; further to the eastward they decrease in height, being in Porto Rico under 4,000, in the Virgin Islands less than 2,000, and in Virgin Gorda only a few hundred feet. The strait which lies between Virgin Gorda and Anguilla separates the region just referred to from the islands to the south, in some of which there is still active volcanic agency. In this latter chain of islands, the mountains rise from 2,500 to 5000 feet. Anguilla, at the northern extremity, and Barbuda and Barbadoes to the eastward of the chain, have comparatively but little elevation.

The number of species of land shells described by Pfeiffer in his Monographs and publications of later date, exceeds 6000, of which nearly one-sixth inhabit the West Indies.* This appears, perhaps, the less extraordinary, when it is considered that about one-half of all the known species are peculiar to islands.

Darwin, in his "Origin of Species," remarks:—"The species of all kinds which inhabit oceanic islands are few in number, compared with those on equal continental areas. Alph. de Candolle admits this for plants, and Wollaston for insects." The author adds, "Although in oceanic islands the number of kinds of inhabitants is scanty, the proportion of endemic species (*i. e.* those found nowhere else in the world) is often extremely large." Dr. J. D. Hooker, in his "Introductory Essay to the Flora of Tasmania," observes, that the total number of species which islands contain, seems to be invariably less than an equal continental area possesses; and the relative numbers of species to genera (or other higher groups) are also much less than in similar continental areas."

Now it is true with respect to land shells, that the proportion of insular endemic species is great, but the number of species, and also their number relatively to genera, far exceed in amount those which inhabit equal continental areas. By way of illustration, I may mention, that the entire American continents, from Greenland to Cape Horn, have afforded very few more species than the West India Islands.

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* In using the general term "West Indies," I include Bermuda, and also Curaçao, and the adjacent island of Buen Ayre.

Prof. C. B. Adams notices (*Cont. to Conchology*, p. 213) that if large groups of such islands as the West Indies should be united in a common area of dry land, "there would be Zoological provinces containing five to tenfold as many species as any which now exist."

Darwin refers to the striking and important fact in regard to the inhabitants of islands, that their affinity is "to those of the nearest mainland without being actually the same species." He instances the Gallapagos Archipelago, "where almost every production of the land and water bears the unmistakable stamp of the American Continent." This instance, as regards land shells, is peculiarly appropriate. In the Gallapagos, Bulimus, the genus most largely developed in South America, is alone represented. Dr. Hooker, in the Essay already referred to, asserts "that most of those Australian orders and genera which are found in other countries around Australia, have their maximum development in Australia at points approximating in geographical position towards those neighboring countries." The generic affinity of the land shells of the West India Islands to those of the adjacent parts of the American Continents is certainly intimate, but the existence of several genera not represented on the Continents shows other relationships—the operation, it may be, of local causes. Seeing, moreover, the greater number of both genera and species, absolutely and proportionately, in the islands under consideration, it may not unreasonably be suggested that the insular stamp has rather been impressed on the fauna of the adjacent continents, than the reverse.

Woodward (*Manual*, p. 387) referring to the Madeiras, and the problem of their colonization, observes—"There is evidence that this mountain group has not arisen newly from the sea, and great probability that it has become insulated by the subsidence of the surrounding land. The character and arrangement of its fauna are probably nearly the same now as when it formed part of a continent." The origin and condition of the West Indies are very different. The presumption is, if indeed there be not evidence of the fact, that the elevation of the islands was gradual—that the tertiary beds which occur there were deposited after the elevation of the central mountains, and the inland cliffs and terraces plainly traceable (I have personally noticed them in Jamaica, Haiti, and Barbados) indicate subsequent elevatory movements, synchronous probably with those which upraised the adjoining continents. There is no reason for believing that subsidence of contiguous lands caused the geographical isolation of this group of islands, certainly not within the period subsequent to the introduction of existing species. The characteristics of the insular faunas were probably the same at the time of their origin on the islands as at present.

As the number of species of land shells in insular provinces is generally much greater proportionally to the area of the provinces than in a continental province, of which the Madeira group is itself a striking example, it may with more reason be assumed that the land shells originated there after, and not anterior to the isolation of the group. Continents by submergence become islands, and islands by emergence become continents, but, as Prof. C. B. Adams* remarks, "such changes require an amount of time exceeding one geological period, during which time there is a change of faunas."

Dr. Hooker states, as a general result of investigation, that the sinking islands, those (so determined by Darwin) characterized as atolls, or as having barrier reefs, contain comparatively fewer species, and fewer generic types than those which are rising. The West Indies are in the latter category, while the

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* The paper entitled "Hints on the Geographical Distribution of Animals with special reference to the Mollusca," by C. B. Adams, in the Contributions, is extremely interesting, and worthy of more notice than it appears to have received.

Madeira Islands (although not in either at the present period), if the number of species of land shells be any criterion, have not been since the origination of such species in the former. Wollaston (*On the Variation of Species*, p. 129) quotes it as the opinion of Lyell that the Madeira beds in which fossil Helices are found were deposited anterior to the destruction of the "Atlantic Province," of which the Madeira Islands are supposed to have been a part; whereas the condition of the fauna would lead to the supposition of its insular rather than continental origin.

Wollaston, referring especially to three species of Helix found in the Madeiras, says, "that these are actual species (saved alive from their fellows, after the wholesale destructions in this Atlantic province had been completed), and no results of insular development, is demonstrated by the fact that two of them (for the third has apparently become extinct[*]) have not altered one iota since the *fossil period*." From this and other similar facts, he concludes,—first, that this *quondam* continent was densely stocked at the beginning with foci of radiation created expressly for itself; and, secondly, that the areas which these various creatures had overspread, before the land of passage was broken up, was extremely limited,—or, which amounts to the same thing, that *their migratory progress was unusually slow*." As regards the West Indies, the "*quondam* continent" question does not arise,—there is no evidence of the breaking up of "the land of passage." Not only are each of the larger islands, according to Wollaston's views, "foci of radiation," but as he states is the case in Madeira, so is it in the West Indies, scarcely a gorge or woodland sierra exists within their bounds "which does not harbor some species essentially its own; and in many instances the ranges of these creatures are so local or confined, that they might be easily overlooked in their respective neighborhoods."

I admit to the fullest extent the slow migratory progress of terrestrial mollusks, but do not believe in any save very trifling modifications of species being induced by local conditions and influences. Causes now in operation are insufficient to account for the present distribution of land shells on such groups of islands as the West Indies, and speaking generally, I can only refer the origin of their faunas to creation subsequent to the elevation of the insulated areas.

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[*] The species referred to, *H. tiarella* W. & B., has since been found alive.

Such insular faunas, Professor Adams remarks, "prove that the islands which they inhabit, have been geographically separate since an era anterior to the introduction of the existing species." But this conclusion, he adds, "does not depend on the assumption that the species would have dispersed themselves over several islands, if they had not always been restrained by water; but on the fact that such small zoological provinces exist nowhere on continents."

Pfeiffer, in his Monographs, divides the inoperculate land shells, including the Proserpinaceæ, into thirty-three genera, of which twenty are specifically represented on the continents of America, and eighteen in the West India Islands. The subjoined table shows the distribution of the latter. Ceres, peculiar to North America (Mexico), and Anostoma, Tomigerus, and Megaspira, belonging to the southern continent, are not found in the islands, and Ennea and Proserpina are wanting on the continents.

It will be seen that Vitrina of North America, and also Proserpina, belonging to that part of the continent by affinity, are found only in the islands west of Portorico, while of the genera of the southern continent Streptaxis is represented only in Trinidad, Clausilia in Portorico, Tornatellina in Portorico and islands east and south* of it, and Balea in Cuba. As regards genera, and also the relative number of species, as shown in

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* Here, and in the tables, I refer to those islands of which lists of species are given in the catalogue. With the islands actually east and south of Portorico I include Curaçao and Buen Ayre.

Table I., the islands west of Portorico are more connected with North America, and those east and south with South America. Portorico itself has in both respects marked affinities with each of the continents.

	North America.	South America.	North and South America.	Islands West of Portorico.	Portorico.	Islands E. and S. of Portorico.
Helix	....	....	*	*	*	*
Streptaxis	....	*	....	....	....	*
Ennea	....	....	....	....	....	*
Bulimus	....	....	*	*	*	*
Spiraxis	....	....	*	*	....	....
Orthalicus	....	....	*	*	....	*
Achatina	....	....	*	*	*	*
Oleacina	....	....	*	*	*	*
Tornatellina	....	*	....	....	*	*
Pupa	....	....	*	*	*	*
Macroceramus	....	....	*	*	*	*
Cylindrella	....	....	*	*	*	*
Balea	....	*	....	*	....	....
Clausilia	....	*	....	....	*	....
Vitrina	*	....	....	*	....	....
Simpulopsis	....	....	*	*	*	....
Succinea	....	....	*	*	*	*
Proserpina	....	....	....	*	....	....

In 1855 Pfeiffer published a catalogue of the Heliceæ arranged in numerous subgenera, but his as well as other similar classifications have not been generally adopted. They seem indeed in many cases extremely arbitrary, and it is not my present intention to enter more than incidentally upon the subject of the geographical distribution of such subgenera, although they afford striking examples of the connexion between the continents and islands which I point out in this paper.

The relative number of species to genera, of Helix and Bulimus for instance, in different parts of America and the islands, and the increased number of genera in tropical America, as exhibited in Table I., are interesting facts.

The operculate land shells are divided by Pfeiffer in his Monograph into forty-four genera, of which thirteen are found in America, and twenty in the West Indies. He has since pro-

posed another, Diplopoma, which is peculiar to Cuba. Bourciera and Hydrocena, represented on the southern continent, do not inhabit the islands. The following table displays the distribution of the insular genera.

	North America.	South America.	North and South America.	Islands West of Portorico.	Portorico.	Islands E. and S. of Portorico.
Geomelania	....	....	....	*	....	....
Truncatella	*	....	....	*	*	*
Cyclotus	....	....	*	*	....	*
Cyclophorus	....	....	*	....	....	*
Megalomastoma	....	*	....	*	*	*
Jamaicia	....	....	....	*	....	....
Licina	....	....	....	*	....	....
Choanopoma	....	....	....	*	*	*
Ctenopoma	*	....	....	*	....	....
Adamsiella	....	....	....	*	....	....
Cyclostomus	....	....	....	*	....	*
Tudora	*	....	....	*	....	*
Diplopoma	....	....	....	*	....	....
Cistula	....	....	*	*	*	*
Chondropoma	....	....	*	*	*	*
Stoastoma	....	....	....	*	*	....
Trochatella	....	*	....	*	....	....
Lucidella	....	....	....	*	....	....
Helicina	....	....	*	*	*	*
Schasicheila	*	....	....	*	....	....
Alcadia	....	....	....	*	....	*

As regards the operculate shells the generic connexion of the islands west of Portorico seems to be greatest with the northern continent, and of those east and south with South America, while Portorico holds an intermediate position. The richness of the West India Islands in operculate genera peculiar to themselves, is very remarkable. The relative number of species to genera on the continents and islands, as with the inoperculate shells, is also noticeable.

The existence in Opara, one of the Polynesian Islands, of the only species of Stoastoma* found elsewhere than in the West Indies is the more curious, seeing that *A. octona* inhabits that island, *Pupa Paredesii Orb.* is attributed to it as well as t South America, and several species of other genera near allied to West Indian forms also occur in it.

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* *S. succineum* Sowb. of Opara differs considerably from the species of the West Indies. Gray separates it from the others, under the subgeneric name of Electrina. The shell is smooth, not spirally costate.

In Table II. lists are given of those species, inhabitants of t West Indies, which are found in other parts of the world, a also of those which are in more than one of the islands. Certa of the islands are distinguished by name,—the last colu includes those E. and S. of Portorico and Viéque. The obj of the Table is to show the *specific*, as of Table I. the *gene* connexion of the islands with the N. and S. American c tinents.

The only species common to Europe and the West Indies a *B. acicula* Müll. (Bermuda), *B. decollatus* L. (Cuba), and *ventrosus* Fer. (Bermuda),—the two former occur also in t southern part of Eastern N. America. *H. similaris* Fer., widely distributed species, found in Brazil, inhabits Barbado but not Cuba, as stated by Pfeiffer (Mon. Hel. I.). *S. ungu* Fer. referred to Guadeloupe by Beau, is also said to belong Bolivia. The other S. American species mentioned in Table are found north of the Equator.

There are twenty-three species of N. America, and twent one (exclusive of *H. similaris* and *S. unguis*) of S. Ameri N. of the Equator, *O. undatus* and *A. octona* being in bot which also occur in the West Indies. Omitting the two latt species, the following is the distribution of the others.

	N. American Species.	*S. American Specie*
In Bermuda	2	None.
In Bahamas, Cuba, and I. of Pines	15	None.
In Jamaica	6	1
In Haiti	4	2
In Portorico and Viéque	6	3
Total in Islands W. of Viéque	18	3
Total in Islands E. and S. of Viéque	7	18

Of species found in Portorico and Viéque (not on the continents) ten are in the islands to the westward, and twenty-one

in those to the east and south. These facts show, the distribution of species being considered, a result similar to that arrived at with regard to the distribution of genera, viz. that the islands west of Portorico are more related to the N. American, and those east and south to the S. American continent—Portorico (with Viéque) being connected with both. It is also noticeable (Table I.) that the species of N. American generic type which are represented in the islands west, and also east and south of Portorico, are generally more numerous in the former, and those of S. American character in the latter.

Only one operculate species, *Helicina subglobulosa* Poey, is common to the American continents and the islands. With that exception all the operculated species inhabiting the islands W. of Portorico (exclusive of Truncatella*) are peculiar to those which they respectively inhabit, while six found in Portorico and Viéque occur in the islands to the eastward.

The following is the number of species in the islands:—

	Inoperculate.	*Operculate.*
Islands W. of Portorico.		
Cuba and I. of Pines . . .	251	179
Jamaica	225	160
Haiti	100	41
	576	380
Portorico and Viéque . . .	80	30
Islands E. and S. of Viéque . .	183	50

The large proportion of operculate species in the islands W. of Portorico, and the diminution of them in that island, and the islands E. and S. of it, is very remarkable. The relative proportion of operculate and inoperculate species prevailing on the continents is shown in Table I. The species common to more than one island are enumerated as belonging to each; but the number peculiar to the islands exceeds one thousand.

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* I omit Truncatella in Table II., having, as I consider, insufficient data as to the distribution of the species, which are, however, included in the Catalogue.

The foregoing remarks are with regard to the relationship of the West India Islands generally with the American continents, and the division of the islands into two groups, those west and those east and south of Portorico, which itself rather belongs to the latter, but this gives an inadequate idea of the interesting and peculiar character of these Insular faunas. My limits preclude any very extended observations; but I propose to state some, at least, of the most striking facts as to the relationships of the islands *inter se.*

The Bahamas, Cuba, and the Isle of Pines are especially connected; Cuba has 17 species found also in Jamaica, 8 in Haiti, 15 in Portorico, and 13 in the islands east and south of Portorico. The development of the subgenus Strophia (Pupa), of Macroceramus, Megalomastoma, Ctenopoma, Chondropoma, Trochatella, and Helicina, the occurrence of the only Balea, and the absence of Geomelania,* Jamaicia, Licina, Stoastoma, and Lucidella are the principal peculiarities of the Cuban fauna. With respect to Jamaica, there are common to it and to Cuba 17, to Haiti 4, to Portorico 10, and to the islands east and south of that island 10 species. The numerous representatives of Sagda (Helix), Proserpina, Adamsiella, Cyclostomus, Tudora, and Alcadia, the exclusive presence of Geomelania, Jamaicia, Licina, Stoastoma (with the exception of one species in Portorico and one in Opara), and Lucidella, and the absence of Strophia (Pupa), Megalomastoma, and Chondropoma, greatly distinguish Jamaica from the neighboring islands. I doubt whether any province in the world of equal area is so rich as Jamaica both in genera and species. Haiti has in common with Cuba 8, with Jamaica 4, with Portorico 8, and with the islands east and south of the latter 8 species. This island has the following peculiarities—the development of Macroceramus and Chondropoma, the occurrence of the only species of Vitrina, and the absence of Proserpina and genera peculiar to Jamaica. Strophia and Megalomastoma, which prevail in Cuba, but are not in Jamaica, are represented in Haiti. The only insular species of Simpulopsis are in Haiti and Portorico; those two islands, nearly equidistant from North and South America, have not the species of Orthalicus which inhabits both sections of the continent and the islands more immediately adjacent to them. I should remark that several of the species common to Cuba, Jamaica, and Haiti, are otherwise widely distributed.

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* Information received at a late moment induces me to suspect the occurrence of Geomelania in Cuba.

No other conclusion, under all the circumstances stated, can be arrived at, but that Cuba with the Isle of Pines and the Bahamas, Jamaica, and Haiti, are entitled to be ranked as three distinct zoological provinces; although Haiti has certainly more relationship with Cuba on the one side and Portorico on the other, than exists between it or Cuba with Jamaica.

Portorico (with Viéque) is characterized by the occurrence of the only species of Clausilia, and one of Tornatellina, two South American genera, absent on the islands westward, a single one of Stoastoma, the absence of several genera of Cyclostomaceæ which are found in the islands to the westward, by the increased number of Bulimi relatively to Helix, and the diminished representation of Macroceramus and Pupa. Portorico is unmistakably related to St. Croix, St. Thomas, St. John, Tortola, Anegada, St. Bartholomew, and Anguilla, as those islands are *inter se.* Megalomastoma* is not represented further to the eastward of Portorico than St. John (I am not certain as to Tortola), and Macroceramus than Anguilla, to the south of which neither of them occurs. Ennea† has one species

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* Megalomastoma is found fossil in the Eocene strata of the Isle of Wight and Paris.

† As to the occurrence of *Ennea bicolor* Gould in St. Thomas, see my remarks in the Annals VI. p. 147. Mr. Theo. Gill subsequently discovered the same species in Trinidad; its occurrence there also is a curious fact.

(the same being found in India) in St. Thomas and Trinidad. Strophia, which occurs in Portorico, has a semi-fossil species in St. Croix, but disappears in the islands east and south of Portorico, with the solitary exception of *S. uva* in Curaçao. The islands above-mentioned as being related to Portorico, have, in common with many of those south of Anguilla, species of Bulimi which also occur in South America.*

St. Christopher, Antigua, the French islands, and those further south, are all more or less connected *inter se*, and in a marked manner with South America. The preponderance of Bulimus, and the paucity of operculated genera and species, are noticeable. No representative of the family Cyclostomacea has yet been found in Barbados. The single Streptaxis, discovered by Mr. Gill in 1859, occurs in Trinidad. Plecochilus (a subgenus of Bulimus), characteristic of South America, only inhabits the islands east and south of Portorico, with the exception of one species, *P. glaber*, attributed, but I think erroneously, to Haiti. Stenopus, a subgenus of Nanina (separated from Helix), is peculiar to St. Vincent. The number of species common to the French West India Islands, and French Guiana, but absent in the intermediate islands, as shown by Drouët (Vide *Mal. Blatt*, 1860, p. 126), is remarkable. In connexion with the fact that the Spanish Islands of Cuba and Portorico have more species in common than either has with Haiti which lies between them, can the partial similarity of faunas be attributed to increased intercourse between the inhabitants belonging in modern times to the same European nation? Some of the species common to the continent and islands, and to more than one island, are, size and habits considered, such as are most likely to have been distributed by human agency.

On the whole, Portorico, with Viéque, and the islands eastward towards Anguilla, may be considered as forming a distinct province, and the remaining islands, more to the south, as another. Whether the division (based on the distribution of the Land Shells) of the West Indies generally into two groups, the one extending eastward from the Northern Continent to Anguilla, and the other southerly from Anguilla to the South American coast, has any connexion with the geological relations of the two mountain chains remarked upon by Humboldt, to which I have already referred, is a curious subject of inquiry.

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* Woodward (*Manual*, p. 388) remarks on several species common to St. Thomas and the Canary Islands, but none such exist.

The extent to which species vary, especially in the larger islands of the West Indies, deserves notice. Dr. Hooker says, "It has been remarked (Bory de St. Vincent, in *Voy. au Quatre Iles de l'Afrique*) that the species of islands are more variable than those of continents, an opinion I can scarcely subscribe to, and which is opposed to Darwin's facts, inasmuch as Insular Floras are characterized by peculiar genera, and by having few species in proportion to genera."

It appears to me that Bory de St. Vincent's observation does, and that "Darwin's facts" do not, apply to land shells. I admit, however, that even on continents their tendency to variation is considerable.

Dr. Hooker remarks—"If a genus is numerically increasing, and consequently running into varieties, it will present a group of species with complex relations *inter se;* if, on the contrary, it is numerically decreasing, such decrease must lead to the extinction of some varieties, and hence result in the better limitation of the remainder." Now, without adopting Dr. Hooker's and Darwin's views as to the origin of species, and their greater limitability by the extinction of varieties, I would state that as in the great majority of the genera of land shells there are numerous groups of species with complex relations *inter se*, that fact may indicate their comparative recent creation. The geological record,* of prior date to the tertiary formations, has

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*** A small fossil body resembling a land shell of the genus Pupa was found by Lyell, with fossil reptilian remains, in the interior of an erect fossil tree in the coal measures of Nova Scotia.**

little evidence of the existence of terrestrial species of shells. The wonderful development both of genera and species on islands, especially those the later geological movements of which have been of elevation, do not at least negative the indication above suggested.

With respect to the *Freshwater Shells* of the West Indies, which are by no means numerous, the distribution of the genera shows the same connexion of the islands west of Portorico with the northern, and of those east and south with the southern continent of America, as do the Land Shells. Of Melania five species occur in Cuba, none in the other islands; one of Melanopsis inhabits Jamaica. The only Unio in the islands is found in Cuba. Two or three species of Ampularia are in Cuba, and one in Jamaica, of North American type, while *A. rugosa* Lam., of South America, occurs in Trinidad and Tobago, and *A. Knorri* Phil, closely allied to *A. cornu arietis?* L., of New Granada, also inhabits the former island. The species of other genera, which are in the islands westward of Portorico, do not generally extend to the islands east and south of it. Several, however, have a remarkably wide distribution. *Planorbis lucidus* Pf. occurs in Cuba, Jamaica, Portorico, and Guadeloupe; *Ancylus obscurus* Hald., of North America, in Jamaica, Portorico, St. Thomas, and Guadeloupe; and *Amnicola crystallina* Pf., which I found abundant in the river Magdalena, at Barranquilla, New Granada, inhabits Cuba, Jamaica, Portorico, Viéque, St. Thomas, St. John, Tortola, and Guadeloupe.*

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* The wide distribution, on the continent of North America, of some of the Unionidæ is really wonderful. Mr. Isaac Lea mentions, in a communication made in 1858 to the Philadelphia Academy, that some species common in the Ohio River, as high up as Pittsburg, are found also in Moose River of Hudson's Bay, 52° N.; in the Red River of the North, 50° N.; in Upper Missouri, 47° N.; and in the Big Sioux, 43° N.; also as far south as Louisiana.

The same remark applies to several terrestrial species of North America. *H. alternata* Say is found from Labrador to Texas, and from the Atlantic ocean to the Rocky Mountains. *H. arborea* Say, which, according to Beau, occurs in Guadeloupe, inhabits an equally wide area, and extends even into New Mexico.

CATALOGUE OF THE LAND SHELLS OF THE WEST INDIA ISLANDS.

[*Abbreviations.* Ad., C. B. Adams, F., Férussac, G., Gundlach, P., Pfeiffer. Py, Poey, W. & M., Weinland and Marten.]

Anegada.

Helix.
notabilis Sh.

Anguilla.

Macroceramus.
signatus Guild.

Antigua (1).

Helix.
formosa F.
Bulimus.
Caraccasensis Rv.
exilis Gm.
fraterculus F.
subula P.
Achatina.
octona Ch.
Cistula.
Antiguensis Sh.

Bahamas (2).

Helix.
Bahamensis P. (*N. P.* and *Turk's Is.*)
gallopavonis Val (*Tk's Is.*)
microdonta Dh (*N. Prov.*)
multifasciata W. & M. (*Crooked Is.*)
provisoria P. (*N. P.*)
Troscheli P. (*Tk's Is.*)?
varians Mk. (*N. P.*)
Bulimus.
nitidulus P. (*Tk's Is.*)
sepulcralis ? Py. (*N. P.*)
Oleacina.
solidula P. (*N. P.*)
Pupa.
alvearia Kust. (*N. P.*)
iostoma P. (*Tk's Is.*)
pellucida P. (*Tk's Is*)
striatella F. (*N. P.*)
Weinlandi Kurr. (*Cr. Is*)
Macroceramus.
Gossei P. (*N. P.*)
Cylindrella
Bahamensis P. (*N. P.*)
Cistula.
scabrosa Humph. (*T. Is.*)
Chondropoma.
biforme P. (*Tk's Is.*)
Hjalmarsoni P. (*Tk's Is.*)
Helicina
candida P. (*Tk's Is.*)
Schasicheila.
minuscula ? P. (*N.P.*)

Barbados (3).

Helix.
Isabella F.
similaris F.
vortex P.
Bulimus.
Barbadensis P,
Caraccasensis Rv.
exilis Gm.
fraterculus F.
fuscus Guild.
Goodalli Mil.
oblongus Müll.
octonoides Ad.
subula P.
Viequensis P.
Achatina.
Gundlachi P.
octona Ch.
Tornatellina.
Antillarum Sh.
Pupa.
Barbadensis P.
Jamaicensis Ad.
pellucida P.
Cylindrella.
costata Guild.
Succinea.
Barbadensis Guild.
Bermudensis P.
Truncatella.
Barbadensis P.
Helicina.
Barbadensis P.
conoidea P.
substriata Gray.

Bermuda (4).

Ins. St. George.

Helix.
Bermudensis P.
circumfirmata Redf.
microdonta Dh.
ochroleuca F. ?
vortex P.
Bulimus.
nitidulus P.
ventrosus F.
Achatina.
acicula Müll.
Pupa.
Jamaicensis Ad.
pellucida P.
Succinea
Bermudensis P.
fulgens Lea.
margarita P.
Truncatella.
subcylindrica Gray.
Helicina.
convexa P.

Buen Ayre.

Bulimus.
elongatus Bolt.

Cuba (5).

Helix.
alauda F.
amplecta G.
Apollo P.
Auberi O.
auricoma F.
avellana F.
Baracoensis Gut.
Bartlettiana P.
Bayamensis P.
Bonplandii Lam.
Boothiana P.
Carpenteriana Bld.
cesticulus G.
comta G.
crassilabris P.
Cubensis P.
cyclostomoides P.
debilis P.
deflexa P
Dennisoni P.
emarginata G.
euclasta Sh.
fuscolabiata Py.
gilva F.
gracilis Py.
Guanensis Py.
Guantanamensis Py.
Gundlachi P.
Gutierrezi Py.
immersa G.
imperator Mtf.
incrustata Py.
jactata G.
Jeannereti P.
Lescaillei G.
Letranensis P.
Lindeni P.
lucipeta Py.
maculifera Gut.
marginelloides O.
melanocephala G.
Mina P.

minuscula By.
Montetaurina P.
morbida Mor.
multistriata Dh.
muscarum Lea.
laevula Mor.
notata Py.
Ottonis P.
ovum-reguli Lea.
paludosa P.
Parraiana O.
parallela Py.
paucispira Py.
Pazenzis Py.
pemphigodes P.
penicillata P.
Petitiana O.
picta Born.
Poeyi Pet.
proboscidea P.
prominula P.
provisoria P.
Rangelina P.
raripila Mor.
rostrata P.
rufo-apicata Py.
Sagemon Bk.
Sagraiana O.
saxicola P.
scabrosa Py.
stigmatica P.
suavis G.
sulphurosa Mor.
supertexta P.
tephritis Mor.
tichostoma P
transitoria P.
translucens G.
Trinitaria G.
turbiniformis P.
versicolor Born.
vortex P.
BULIMUS.
acuticostatus O
angustatus G.
assurgens P.
decollatus L.
gigas Py.
Goodalli Mil.
gracillimus P.
hasta P.
homalogyrus Sh.
lucidus Py.
Manzanillensis G.
marginatus Lay.
Marielinus Py.
nitidulus P.
octonoides Ad.
Poeyanus P.
sepulchralis Py.
strictus Py.
subula P.
terebraster Lam.
SPIRAXIS.
Cubaniana O.
episcopalis Mor.
melanielloides G.
paludinoides O.
suturalis P.
ORTHALICUS.
undatus Brug.
ACHATINA.
abdita Py.
Blainiana Py.
consobrina O.
elata G.
exilis P.
emarginata Swain ?
fasciata Müll.
Gundlachi P.
octona Ch.
picta Rv.
Poeyana P.
pusilla P.
pygmaea P.
subulatoides O.
Trinitaria G.
OLEACINA.
cyanozoaria G.
Lindoni P.
oleacea F.
orysacea O.
Ottonis P.
regularis G.
saturata G.
sicilis Mor.
solidula P.
subulata P.
translucida G.
Trinitaria G.
PUPA.
Cumingiana P.
cyclostoma K.
Gundlachi P.
incana By.
iostoma P.
marginalba P.
maritima P.
marmorata P.
microstoma P.
multicosta K.
Mumia Brug.
Mumiola P.
neglecta Arango.
pellucida P.
Proteus G.
Sagraiana P.
scalarina G.
sculpta Py.
striatella F.
tenuidens Ad.
tumidula Dh ?
venusta Py.
vulnerata K.
MACROCERAMUS.
amplus G.
angulosus G.
catenatus G.
claudens G.
costulatus G.
festus G.
Gossei P.
Gundlachi P.
inermis G.
Jeannereti G.
notatus G.
Pazi G.
pictus G.
turricula P.
unicarinatus Lam.
CYLINDRELLA.
acus P.
angulifera G.
Brooksiana G.
Camoensis P.
cinerea P.
coerulans Py.
crispula P.
cyclostoma P.
discors Py.
elegans P.
Elliotti Py.
Fabreana Py.
fastigiata G.
gracillima Py.
Gundlachiana Py.
Humboldtiana P.
integra P.
interrupta G.
intusmalleata G.
irrorata G.
laevigata G.
lateralis Paz.
Lavalleana O.
marmorata Sh.
minuta G.
nubila Py.
ornata G.
Oviedoiana O.
perlata G.
Philippiana P.
planospira P.
plicata Py.
Poeyana O.
porrecta Gould.
producta G.
Rugeli Sh.
Sagraiana P.
Sauvalleana G.
scalarina Sh.

Shuttleworthi Py.
Sowerbyana P.
strangulata Py.
subita Py.
torquata Mor.
Turcasiana G.
uncata G.
variegata P.
ventricosa G.
volubilis Mor.
BALEA.
Canteroiana G.
SUCCINEA.
angustior Ad.
fulgens Lea.
Gundlachi P.
macta Py.
nobilis Py.
ochracina G.
Sagra O.
tenuis G.
TRUNCATELLA.
bilabiata P.
capillacea G.
Caribæensis Sow.
elongata Py.
filicosta G.?
lirata Py.?
pulchella P.
scalaris Mich.
subcylindrica Gray.
CYCLOTUS.
minimus G.
perdistinctus G.
MEGALOMASTOMA.
alutaceum Mk.
apertum Py.
auriculatum O.
bituberculatum Sow.
complanatum P.
digitale G.
Gundlachi P.
leoninum P.
Mani Py.
seminudum Py.
tortum Wood.
ventricosum O.
CHOANOPOMA.
alatum P.
Arangianum G.
auricomum G.
Daudinoti G.
decoloratum G.
eburneum G.
fragile G.
minium G.
majusculum Mor.
perplicatum G.
Pretrei O.
tractum G.
Yaterasense P.
Yunquense P.
CTENOPOMA.
argutum P.
bilabiatum O.
coronatum Py.
deficiens G.
denegatum Py.
echinatum Py.
enode Py.
Garridoianum Py.
honestum Py.
immersum G.
nigriculum G.
nodulatum Py.
perspectivum G.
rotundatum Py.
rugulosum P.
sculptum G.
semicoronatum G.
sordidum G.
torquatum Gut.
ADAMSIELLA.
chordatum G.
CYCLOSTOMUS.
Rangelinus Py.
TUDORA.
canescens P.
erectum G.
excurrens G.
lurida G.
DIPLOPOMA.
architectonicum G.
CISTULA.
Agassizi Charp.
agrestis G.
catenata Gould.
illustris Py.
inculta Py.
interstitiale G.
limbiferum Mk.
Mackinlayi G.
pallida P.
procax Py.
radula P.
CHONDROPOMA.
abnatum G.
Candeanum O.
claudicans Py.
crenimargo P.
decurrens Py.
Delatreanum O.
dilatatum G.
egregium G.
Gutierrezi G.
harpa P.
irradians Sh.
laetum Gut.
latilabre O.
latum G.
marginalbum G.
moestum Sh.
neglectum G.
obesum Mk.
Ottonis P.
oxytremum G.
perlatum G.
Pfeifferianum Py.
pictum P.
Poeyanum O.
revinctum Py.
revocatum G.
rufopictum G.
Sagebieni Py.
semicanum Mor.
sericatum Mor.
Shuttleworthi P.
solidulum G.
tenebrosum Mor.
textum G.
unilabiatum G
violaceum P.
TROCHATELLA.
chrysostoma Sh.
conica P.
dilatata Py.
hians Py.
Petitiana O.
petrosa G.
politula Py.
regina Mor.
rubicunda G.
rupestris P.
Sloanei O.
stellata Val.
subunguiculata Py.
HELICINA.
acuminata Val.
adspersa P.
Bastidana Py.
Bayamensis Py.
bellula G.
Blandiana G.
Briarea Py.
chrysochasma Py.
ciliata Py.
columellaris G.
concinna G.
continua G.
declivis G.
elongata O.
exserta G.
glabra Gould.
globulosa O.
granum P.
jugulata Py.
Lembeyana Py.
littoricola G.
Mayarina Py.
nitida P.

Orbignyi P.
Poeyi P.
proxima G.
pulcherrima Lea.
pyramidalis Sow.
Reeveana P.
remota Py.
retracta Py.
rotunda O
rubromarginata G.
rugosa P.
Sagraiana O.
silacea Mor.
spectabilis G.
straminea Mor.
subdepressa Py.
subglobulosa Py.
submarginata Gray.
Titanica Py.

ALCADIA.
capax G.
dissimulans Py.
gonostoma G.
Gundlachi P.
hispida P
incrustata G.
minima O.
velutina Py.

PROSERPINA.
depressa O.

Curaçao.

HELIX.
pentodon Mke.

PUPA.
uva L.

TUDORA.
megacheila P. & M.

Grenada (6).

HELIX.
perplexa F.

BULIMUS.
Caraccasensis Rv.
glaber Gm.
octonoides Ad.
subula P.

TORNATELLINA.
Funcki P.

CYCLOTUS.
Granadensis Sh.

HELICINA.
Heatei P.

Grenadines.

HELIX
perplexa F.

ORTHALICUS.
undulatus Guild. (*Union I.*)

Guadeloupe (7).

HELIX.
arborea Say.
badia F.
Baudoni P.
dentiens F.
Josephinæ F.
lychnuchus Müll.
pachygastra Gr.
Schrammii Fisch.

BULIMUS.
Caraccasensis Rv.
chrysalis P.
elongatus Bolt.
exilis Gm.
Lherminieri Fisch.
limnoides F.

ACHATINA.
octona Ch.

OLEACINA.
Guadeloupensis P.

TORNATELLINA.
lamellata P. & M.

CYLINDRELLA.
collaris F.

SUCCINEA
Candeana Lea.
depressa Rang.
patula Br.
unguis F.

TRUNCATELLA.
Caribæensis Sow.
clathrus Lowe
modesta Ad
scalaris Mich.

CYCLOPHORUS.
Beauianus Pet.
Schrammi Sh.

CHONDROPOMA.
crenulatum F.

HELICINA.
fasciata Lam.
Guadaloupensis Sow.?
rhodostoma Gray?
similis Sow.?

Haiti (8).

HELIX.
acuminata P.
Albersiana P.
angistoma F.
angustata F.
Audebardi P.
Caracolla L.
cepa Müll.
cornu-militare L.
crispata F.
desiderata P.
dilatata P.
disculus Dh.
dissita Dh.
Dominicensis P.
excellens P.
Gaskoini P.
Haitensis W. & M
hilum W. & M.
Hjalmarsoni P.
indentata Say.
indistincta F.
Justi F.
lampas Müll.?
leucoraphe P.
loxodon P.
monodonta Lea.
Phaedra P
polyodon W. & M.
pruinosa P.
ptycoraphe W. & M.
pubescens P.
sarcocheila Mörch.
strumosa P.
trizonalis Grat.
undulata F.
vortex P.

BULIMUS.
Caraccasensis Rv.
Dominicus Rv.
exilis Gm.
glaber Gm.?
hasta P.
marginatus Say.
Moussoni P.
nitidulus P.
rectus P.
Salleanus Rv.
Santanensis P.

SPIRAXIS.
Dunkeri P.
Richardi P.
Salleana P.

ACHATINA.
impressa P.
octona Ch.
virginea L.

OLEACINA.
biplicata W. & M.
oleacea F.
ptycoraphe W. & M.
terebræformis Sh.
texta W. & M.

PUPA.
glans Kust.
microstoma P.
striatella F

MACROCERAMUS.
angulatus W. & M.
cyrtopleurus P.
formosus Wood.
Gundlachi P.
Hermanni P.

lineatus Br.
Ludovici P.
Richaudi Pet.
signatus Guild.
tenuiplicatus P,
virgineus W. & M.
CYLINDRELLA.
Adamsiana P.
arcuata W. & M.
crenata W. & M.
cristata W. & M.
Dominicensis P.
Eugenii Dorhn.
fasciata Ch.
flammulata P.
Gouldiana P.
Gruneri Dunk.
Guigouana Pet.
Hjalmarsoni P.
Laterradii Grat. *Ins. Bente.*
Ludersi P.
malleata P.
Menkeana P.
monilifera P.
obesa W. & M.
puncturata P.
Salleana P.
sericea P.
tricolor P.
tumidula W. & M.
Weinlandi P.
SIMPULOPSIS.
Dominicensis P.
VITRINA.
———? sp. ind.
SUCCINEA.
Dominicensis P.
margarita P.
CYCLOTUS.
floccosus Sh.
MEGALOMASTOMA.
Orbignyi P.
CHOANOPOMA.
Adolfi P.
Puertoplatense P.
Rosaliae P.
solutum Rich.
tentorium P.
Wilhelmi P.
CTENOPOMA.
Dominicense P.
CYCLOSTOMUS.
Aminensis P.
TUDORA.
nobilis P.
pupaeformis Sow.
CISTULA.
cinclidodes P.
CHONDROPOMA.
adulterinum P.
blandum P.
Caricae P.
eusarcum P.
hemiotum P.
litturatum P.
Loweanum P.
magnificum Sallé.
Petiteanum P.
Salleanum P.
semilabre Lam.
simplex P.
TROCHATELLA.
elegantula P.
opima Sh.
virginea Lea.
HELICINA.
cingulata P.
Dominicensis P.
festiva Sow.
globosa Gray.
malleata P.
oleosa P.
pygmaea P. & M.
rufa P.
rugosa P.
Salleana P.
versicolor P.
viridis Lam.
ALCADIA.
succinea P.

I. of Pines.

HELIX.
auricoma F.
Bonplandii Lam.
Boothiana P.
comes Py.
Pityonesica P.
BULIMUS.
Beathinus Py.
Poeyanus P.
strictus Py.
terebra Py.
ACHATINA.
fasciata Müll.
OLEACINA.
follicularis Mor.
oleacea Fer.
orysacea Mor.
solidula P.
subulata P.
CYLINDRELLA.
pruinosa Mor,
MEGALOMASTOMA.
procer Py.
TUDORA.
Moreletiana Pet.
pupoides Mor.
CHONDROPOMA.
dissolutum P.
TROCHATELLA.
callosa Py.
constellata Mor.
luteo-apicata Py.
HELICINA.
scopulorum Mor.
PROSERPINA.
globulosa O.

Jamaica (*).

HELIX.
abnormis P.
acuta Lam.
albicans P.
alligans Ad.
alveus Ad.
ambigua Ad.
angustispira Ad.
anomala P.
Anthoniana Ad.
aspera F.
atavus Sh.
Bainbridgei P. ?
Blandiana Ad.
Boothiana P.
brevior Ad.
brevis Ad.
Bronni P.
Buddiana Ad.
cara Ad.
Carmelita F.
Chemnitziana P.
cognata F.
columellata Ad.
connectens Ad.
conspersula P.
Cookiana Gm.
diminuta Ad.
dioscoricola Ad.
epistylioides F.
epistyliulum Ad.
Foremaniana Ad.
fuscocinata Ad.
fuscolabris Ad.
fuscula Ad.
Gossei Ad.
graminicola Ad.
Haldemaniana Ad.
Hollandi Ad.
immunda Ad.
inconspicua Ad.
ingens Ad
invalida Ad.
invasa P.
Jacobensis Ad.
Jamaicensis Ch.
Jayana Ad.
lamellifera Ad.
lucerna Müll.
Mac Murrayi Ad.

margarita P.
McNabiana Chitty.
minuscula By.
munda Ad.
nemoraloides Ad.
nobilis Ad.
Okeniana P.
osculans Ad.
pallescens Sh.
paludosa P.
patina Ad.
peracutissima Ad.
peraffinis Ad.
perdepressa Ad.
picturata Ad.
pila Ad.
pretiosa Ad.
propenuda Ad.
Proserpinula P.
ptychodes P.
rufula P.
Schroeteriana P.
similis Ad.
Simson P.
simulans Ad.
sincera Ad.
sinuata Müll.
sinuosa F.
soror F.
Spengleriana P.
spiculosa Sh.
spreta Ad.
straminea Alb.
strangulata Ad.
subconica Ad.
tenerrima Ad.
torrefacta Ad.
tridentina F.
triptycha Sh.
tumida P.
turbiniformis F.
valida Ad.
virginea Ad.

Bulimus.
confertus P.
erubescens P.
Goodalli Mil.
hortensis Ad.
immaculatus Ad.
Jamaicensis Rv.
laeviusculus Ad.
macrospira Ad.
marginatus Say.
minimus Ad.
monodon Ad.
nitidiusculus Ad.
nitidulus P.
octonoides Ad.
pallidus Ad.
rufescens Gray.
subula P.
terebella Ad.

Spiraxis.
aberrans P.
Adamsiana P.
brevis Ad.
contorta Chitty.
costulosa Ad.
inusitata Ad.
mirabilis Ad.

Orthalicus.
undatus Brng.

Achatina.
Adamsiana Chitty.
arcuata P.
costulata Ad.
curvilabris P.
Gossei P.
gracilior Ad.
Gundlachi P.
iota Ad.
levis Ad.
longispira Ad.
micans Ad.
octona Ch.
osculans Ad.
parvula Chitty.
pellucens Ad.
puella Ad.
solitaria Ad.
striosa Ad.
tenera Ad.

Oleacea.
angiostoma Ad.
Blandiana Ad.
costulosa Ad.
Dominicensis Gm.
Gayana Ad.
Griffithsi Ad.
Ingallsiana Ad.
Jamaicensis P.
leucozonias Walch.
ligata Ad.
nemorensis Ad.
nitida Ad.
perplexa Ad.
Philippiana P.
Philipsi Ad.
procera Ad.
propinqua Ad.
proxima Ad.
similis Ad.
unicolor Ad.
venusta Ad.
vicina Ad.

Pupa.
contracta Say?
exilis Ad.
Grevillei Chitty.
hexodon Ad.
Jamaicensis Ad.
Jardineana Chitty.
lata Ad.
pellucida P.
tenuidens Ad.

Macroceramus.
Gossei P.

Cylindrella.
abbreviata Dh. ?
Agnesiana Ad.
alabastrina P.
alba Ad.
amethystina Chitty.
aspera Ad.
Augustae Ad.
Baquieana Chitty.
Blandiana P.
brevis P.
columna Ad.
costulata Ad.
cylindrus Ch.
dubia Chitty.
Dunkeriana P.
elatior Ad.
elongata Ch.
Gossei P.
gracilis Wood.
Gravesii Ad.
Hollandi Ad.
Humboldtiana P. ?
humilis Ad.
hydrophana Chitty.
inornata Ad.
lata Ad.
macrostoma P.
Maugeri Wood.
megacheila Chitty.
nobilior Ad.
ovata Desh. ?
Pearmaneana Chitty.
princeps Ad.
pupaeformis Ad.
pusilla Ad.
Robertsi Ad.
rosea P.
sanguinea P.
seminuda Ad.
similis Ad.
simplex Ad.
striata Chitty.
subula F.
tenella Ad.
tricolor P.
variegata P. ?
zebrina P.
zonata Ad.

Succinea.
angustior Ad.
contorta Ad.

latior Ad.
Sagra O.
GEOMELANIA.
affinis Ad.
Beardsleana Ad.
conica Ad.
costulosa Ad.
elegans Ad.
exilis Ad.
expansa Ad.
fortis Ad.
gracilis Ad.
Greyana Ad.
Hilliana Ad
inornata Chitty.
Jamaicensis P.
magna Ad.
media Ad.
minor Ad.
parva Chitty.
pauperata Ad.
procera Ad.
pygmaea Ad.
pyramidata Ad.
sinuosa Chitty.
striosa Ad.
typica Ad.
vicina Ad.
TRUNCATELLA.
Adamsi P.
Caribaeensis Sow.
modesta Ad.
pulchella P.
scalaris Mich.
CYCLOTUS.
asperulus Som.
corrugatus Sow.
crassus Ad.
dubiosus Ad.
Jamaicensis Ch.
jugosus Ad.
pallescens Ad.
perpallidus Ad.
subrugosus Sow.
suturalis Sow.
varians Ad.
JAMAICIA.
anomala Ad.
Moussoniana Ad.
LICINA.
dubia Gm.
labeo Müll.
CHOANOPOMA.
Chittyi Ad.
fimbriatulum Sow.
granosum Ad.
Hillianum Ad.
interruptum Lam.
lima Ad.
lincina L.
lincinellum Lam.
mite P.
pulchrum Wood.
scabriculum Sow.
spinulosum Ad.
CTENOPOMA.
Campbelli Ad.
pisum Ad.
Wilkinsoni Ad.
ADAMSIELLA.
chlorostoma Sow.
Grayana P.
ignilabris Ad.
intermedia Ad.
mirabilis Wood.
miranda Ad.
monstrosa Ad.
moribunda Ad.
Pearmaneana Chitty.
pulchrior Ad.
variabilis Ad.
xanthostoma Sow.
CYCLOSTOMUS.
albus Sow.
Banksianus Sow.
Bronni Ad.
Chevalieri Ad.
crenulosus Ad.
Humphreyanus P.
Jayanus Ad.
lamellosus Ad.
Redfieldianus Ad.
retrorsus Ad.
serecinus Ad.
tectilabris Ad.
thysanoraphe Sow.
Yallahensis Ad.
TUDORA.
Adamsi P.
armata Ad.
Augustae Ad.
avena Ad.
Barklyana Chitty.
columna Wood.
fascia Wood.
fecunda Ad.
Griffithiana Ad.
maritima Ad.
mutica Ad.
papyracea Ad.
pauperata Ad.
simulans Ad.
Tappaniana Ad.
versicolor P ?
CISTULA.
dislocata Baird.
lugubris P.
mordax Ad.
sagittifera Ad.
Sauliae Sow.
Shephardiana Ad.
STOASTOMA.
Agassizianum Ad.
Anthonianum Ad.
Blandianum Ad.
Chittyanum Ad.
Cumingianum Ad.
Fadyenianum Ad.
Gouldianum Ad.
Hollandianum Ad.
Jayanum Ad.
Leanum Ad.
Lindsleyanum Ad.
Moricandianum Ad.
Petitianum Ad.
Pfeifferianum Ad.
Philippianum Ad.
pisum Ad.
Redfieldianum Ad.
Tappanianum Ad.
Vilkinsoniae Ad.
TROCHATELLA.
Chittyana P.
Grayana P.
Josephinae Ad.
nobilis Ad.
pulchella Gray.
Tankervillei Gray.
tenuis Ad.
LUCIDELLA.
aureola F.
nana P.
HELICINA.
Adamsiana P.
ampliata Ad.
aurantia Gray.
costata Gray.
depressa Gray.
Jamaicensis Sow.
lineata Ad.
maxima Sow. ?
neritella Lam.
nobilis Ad.
ALCADIA.
Brownei Gray.
citrinolabris Ad.
consanguinea Ad.
dubiosa Ad.
Gossei P.
hirsuta Ad.
Hollandi Ad.
macilenta Ad.
major Gray.
megastoma Ad.
microstoma Ad.
palliata Ad.
pusilla Ad.
solitaria Ad.

PROSERPINA.
bidentata Ad.
linguifera Jonas.
nitida Gray.
pisum Ad.

Marie-Galante.

HELIX.
badia F.
HELICINA.
fasciata Lam.

Martinique.

HELIX.
auridens Rang.
badia F.
bracteola F.
crassidens P.
dentiens F.
desidens Rang.
discolor F.
lychnuchus Müll.
nigrescens Wood. ?
nucleola Rang.
nuxdenticulata Ch.
obesa Bk.
orbiculata F.
pachygastra Gray
parilis F.
stenostoma P.
BULIMUS.
chrysalis P.
elongatus Bolt.
Martinicensis P.
multifasciatus Lam.
ACHATINA.
semitarum Rang.
CYLINDRELLA.
collaris F.
SUCCINEA.
Candeana Lea.
haliotoidea Mitt.
rubescens Dh.
CYCLOTUS
Martinicensis Sh.
CYCLOPHORUS.
rufescens Sow.
CHOANOPOMA.
occidentale P.
HELICINA.
Antillarum Sow.
fasciata Lam.
platycheila Mulhf.
plicatula P.
striatula Sow.

Portorico (10).

HELIX.
angulata F.
Arecibensis P.
bryodes Sh.
Caracolla L.
concolor F.
dermatina Sh.
diaphana Lam.
euclasta Sh.
Gundlachi P.
lima F.
Luquillensis Sh.
marginella Gm.
minuscula By.
musicola Sh.
obliterata F.
plagioptycha Sh.
Portoricensis P.
Riisei P.
squamosa F.
subaquila Sh.
velutina Lam.
vortex P.

BULIMUS.
alabastrinus Sh.
elongatus Bolt.
exilis Gm.
fraterculus F.
Gompharium Sh.
Goodalli Mil.
hasta P.
Hjalmarsoni P.
liliaceus F.
margaritaceus Sh.
marginatus Say.
nitidulus P.
octonoides Ad.
opalescens Sh.
stylodon Sh.
subula P.
Swiftianus P.
terebraster Lam.
ACHATINA.
acicularis Sh.
octona Ch.
OLEACINA.
glabra P.
interrupta Sh.
Portoricensis P.
sulculosa Sh.
terebraeformis Sh.
TORNATELLINA.
Antillarum Sh.
PUPA.
hexodon Ad.
microstoma P.
pellucida P.
striatella F.
MACROCERAMUS.
microdon P.
CYLINDRELLA.
pallida Guild.
Portoricensis P.
Riisei P.
CLAUSILIA.
tridens Ch.
SIMPULOPSIS.
Portoricensis Sh.
SUCCINEA.
approximans Sh.
hyalina Sh.
Riisei P.
TRUNCATELLA.
clathrus Lowe.
pulchella P.
subcylindrica Gray.
MEGALOMASTOMA.
cylindraceum Ch.
verruculosum Sh.
CHOANOPOMA.
decussatum Lam.
senticosum Sh.
CISTULA.
lineolata Lam.
Riisei P.
CHONDROPOMA.
Blauneri Sh.
Newcombianum Ad.
Newtoni Sh.
Swifti Sh.
STOASTOMA.
Portoricense P.
HELICINA.
fasciata Lam.
foveata P.
Hjalmarsoni P.
phasianella Sow.
striata Lam.
subfusca Menke.
trochulina O.
umbonata Sh.
vinosa Sh

St. Bartholomew.

HELIX.
notabilis Sh.
CHOANOPOMA.
sulculosum F.

St. Christopher.

HELIX.
Josephinae F. a. *f.*
BULIMUS.
exilis Gm.
fraterculus F.
multifasciatus Lam.
SUCCINEA.
patula Brug.
HELICINA.
fasciata Lam.

St. Croix (11).

- Helix.
  - Caracolla L. *s. f.*
  - marginella Gm. *s. f.*
  - Santacruzensis P.
  - variegata Ch. ?
  - vortex P.
- Bulimus.
  - elongatus Bolt.
  - extinctus P. *s. f.*
  - fraterculus F.
  - marginatus Say.
- Pupa.
  - rudis P.
- Cylindrella.
  - chordata P.
- Succinea.
  - Riisei P.
- Cyclostomus.
  - fallax P. ?
- Cistula.
  - rutilabris Beck.
- Chondropoma.
  - Santacruzense P.

St. John.

- Helix.
  - euclasta Sh.
  - nemoralina Pet.
  - notabilis Sh.
  - subaquila Sh.
- Bulimus.
  - elongatus Bolt.
  - fraterculus F.
  - Goodalli Mil.
  - octonoides Ad.
  - subula P.
  - Swiftianus P.
- Achatina.
  - octona Ch.
- Pupa.
  - pellucida P.
- Macroceramus.
  - microdon P.
- Cylindrella
  - pallida Guild.
- Succinea.
  - approximans Sh.
- Megalomastoma.
  - Antillarum Sow.
- Chondropoma.
  - Newcombianum Ad.
- Helicina.
  - phasianella Sow.
  - subfusca Mk.
- Alcadia.
  - rubella P.

St. Lucia (12).

- Helix.
  - orbiculata F.
- Bulimus.
  - aulacostylus P.

St. Martin.

- Bulimus.
  - elongatus Bolt.
  - exilis Gm.

St. Thomas (13).

- Helix.
  - euclasta Sh.
  - Gundlachi P.
  - incerta F. *s. f.*
  - nemoralina Pet.
  - subaquila Sh.
  - vortex P.
- Ennea.
  - bicolor Gould.
- Bulimus.
  - Barbadensis P.
  - diaphanus P.
  - elongatus Bolt.
  - exilis Gm.
  - fraterculus F.
  - Goodalli Mil.
  - gracillimus P.
  - octonoides Ad.
  - subula P.
  - Swiftianus P.
- Achatina.
  - Gundlachi P.
  - octona Ch.
- Pupa.
  - Jamaicensis Ad.
  - pellucida P.
- Macroceramus.
  - microdon P.
- Cylindrella.
  - gracillicollis F. ?
  - pallida Guild.
- Succinea.
  - approximans Sh.
  - Barbadensis P.
- Truncatella.
  - clathrus Lowe.
  - pulchella P.
  - subcylindrica Gray.
- Megalomastoma.
  - Antillarum Sow.
- Chondropoma.
  - Newcombianum Ad.
  - Santacruzense P.
- Helicina.
  - foveata P.
  - subfusca Menke.
- Alcadia.
  - rubella P.

St. Vincent.

- Helix.
  - cruentata Guild.
  - livida Guild.
- Bulimus.
  - auris-Sileni Born.
  - exilis Gm.
  - limnoides F.
  - oblongus Müll.
  - stramineus Guild.
  - undulatus Guild.
  - Vincentinus P.
- Succinea.
  - Cuvieri Guild.
  - tigrina Less.
- Helicina.
  - occidentalis Guild.

Tobago.

- Bulimus.
  - oblongus Müll.

Tortola.

- Helix.
  - nemoralina Pet.
  - notabilis Sh.
- Achatina.
  - octona Ch.
- Tornatellina.
  - Antillarum Sh.
- Macroceramus.
  - microdon P.
  - signatus Guild.
- Cylindrella.
  - pallida Guild.
- Chondropoma.
  - Tortolense P.

Trinidad (14).

- Helix.
  - discolor F. ?
- Streptaxis.
  - deformis F.
- Ennea.
  - bicolor Gould.
- Bulimus.
  - Caraccasensis Rv.
  - fraterculus F.
  - glaber Gm.
  - multifasciatus Lam.
  - oblongus Müll.
- Orthalicus.
  - undatus Brug.
- Achatina.
  - octona Ch.
- Tornatellina.
  - Antillarum Sh.
- Cylindrella.
  - Trinitaria P.
- Cyclostomus.
  - citrinus Sow.

Vieque.

HELIX.
  Caracolla L.
  diaphana Lam.
  dioscoricola Ad.
  euclasta Sh.
  Gundlachi P.
  lima F.
  marginella Gm.
  plagioptycha Sh.
  Riisei P.
  subaquila Sh.

BULIMUS.
  elongatus Bolt.
  exilis Gm.
  fraterculus F.
  octonoides Ad.
  Swiftianus P.
  Viequensis P.

ACHATINA.
  octona Ch.

PUPA.
  pellucida P.

SUCCINEA.
  approximans Sh.

CHOANOPOMA.
  decussatum Lam.
  senticosum Sh.
  sulculosum F.

HELICINA.
  fasciata Lam.
  foveata P.
  phasianella Sow.
  vinosa Sh.

NOTES.

1. *Antigua.*—The species which have come under my notice from this island, and St. Christopher, were collected by the Rev. A. Hamilton.

2. *Bahamas.*—The New Providence shells were collected by Mr. Wm. Cooper, and Mr. T. Smitten,—those from Turk's Island by Mr. Theo. Gill and others.

3. *Barbados.*—For these shells I am indebted to the late Rev. J. Parkinson, Mr. Gill, &c. *B. oblongus* Müll. was introduced by Mr. Parkinson from St. Vincent.

4. *Bermuda.*—Collections were made by the late Prof. C. B. Adams, also by Mr. R. Swift, Mr. Temple Prime, myself, and others. As to *H. microdonta Dh.* extensively distributed as *H. delitescens Sh.* see my remarks, *Annals* vii. p. 140.

5. *Cuba.*—I have been liberally supplied with Cuban species, especially by Prof. Poey, Dr. Gundlach, Mr. Shuttleworth, Bishop Elliott, &c. Some errors may be detected in the Catalogue arising from differences of opinion and also of classification, of Poey and Pfeiffer. I should quote the following from Poey, *Mem.* ii. p. 406—"Helices *rostrata P.*, *marginelloides O.*, *Pazensis Py.*, *transitoria P.*, *Arangiana Py.*, *Gutierrezi Py.*, *marginatoides O.*, *mina P.*, varietates sunt H. Sagemonis; quod in itinere Cl. J. Gundlach demonstratum est. Transitiones exstant; animal in omnibus idem est." As to *H. Carpenteriana* Bland, see *Annals* vii. p. 138.

The occurrence in species belonging to Cyclostomacea, of a perforation at the upper margin of the aperture, is peculiar, I believe, to those inhabiting Cuba and the Bahamas. See Poey, *Mem.* ii. p. 40.

6. *Grenada and Grenadines.*—Dr. W. Newcomb collected in Grenada, and I have received shells from him, Rev. J. Parkinson, and Mr. R. Swift.

7. *Guadeloupe.*—I have had comparatively few authentic specimens from the French islands. Beau in his Catalogue (1858) excludes several species generally attributed to this island.

8. *Haiti.*—I am principally indebted for Haitian shells to M. Sallé, Mr. Cuming, and Mr. Swift. The discovery of Vitrina was made by Mr. Hjalmarson, in 1858.

9. *Jamaica.*—Very numerous specimens collected by Prof. C. B. Adams, Mr. Chitty, M. Roy, myself, and others, have come under my notice. Pfeiffer *Mon.* iv. treats *Geomelamia Greyana* C. B. Ad., as a Cylindrella—it was so originally described by Adams, but he subsequently corrected the error. Many new species of Cyclotus and Stoastoma were described by Mr. Chitty in the Zool. Proc. in 1857, but as they do not appear to have been adopted, I omit them.

10. *Portorico and Viéque.*—I received very many of the species of these islands, collected by the late Mr. Blauner, from Mr. Shuttleworth—also from Messrs. Swift, Riise, Knox, and others.

11. *St. Croix.*—For these shells, as well as for those from St. John and Tortola, I am principally indebted to Mr. A. H. Riise, H. Krebs, R. Swift, and H. Haägensen. Two semi-fossil species of Cyclostoma have been described by Pfeiffer—*C. basicarinatum* and *C. chordiferum*.

12. *St. Lucia.*—I am satisfied that the information afforded by the late Mr. McMurray as to the habitat of *B aulacostylus* Pfr., was incorrect. It belongs to St. Lucia, as originally stated by the Rev. E. Hartvig.

13. *St. Thomas.*—Nearly all the species were collected by myself in 1852. See my Notes in *Cont. to Conch*, p. 215, and *Annals*, vi. p. 74.

14. *Trinidad.*—From the late Mr. McMurray, and especially Mr. Theo. Gill, I received these shells.

The names of several islands do not appear in the Catalogue, because I am ignorant as to the species inhabiting them—Dominica, for instance, from which I have never seen or even heard of any species. Further examination of Haiti, and other islands, as well as of the Continents of America, will doubtless afford many new species, but I do not anticipate that they will sensibly affect the conclusions at which I have arrived with regard to the faunas of the islands.

Although disagreeing with Pfeiffer as to the nomenclature and synonymy of some of the West India species, my limits do not permit of reference to such questions. In the Catalogue I have adopted his classification, and in a few instances have exercised my own judgment as to species, where I differ from him. Much labor has been bestowed on the Catalogue, and I would mention that my chief object in publishing it is to show the grounds on which my views as to the geographical distribution of the species generally are founded.

At page 345 the numbers of Inoperculate and Operculate species which occur in the islands E. and S. of Viéque are stated to be 183 and 50, the species common to more than one island being enumerated as belonging to each. The actual numbers, reckoning each species once only, are 102 Inoperculate, and 43 Operculate.

XXXIV.—*Notice of Land and Freshwater Shells collected by Dr. J. G. Cooper in the Rocky Mountains, etc., in* 1860.

BY T. BLAND AND J. G. COOPER.

Read June 17, 1861.

THE shells, which form the subject of this paper, were collected by Dr. J. G. Cooper, during the progress of a military expedition under the command of Major Blake, U.S.A. The party went from St. Louis in the Spring of 1860 by steamboat to Fort Benton, crossed over the mountains from that point to the waters of the Columbia River, where it again embarked, and proceeded to the Pacific Coast.

Dr. Cooper forwarded his notes and specimens to Mr. W. Cooper, who placed them in the hands of Mr. T. Bland with a view to the preparation of the subjoined notice.

Helix Townsendiana Lea, Trans. Amer. Phil. Soc., vi. 99, pl. 23, f. 80.

This species was brought by Mr. Nuttall, Dr. Townsend, and the United States Exploring Expedition from the neighborhood of the Wahlamat, near its junction with the Columbia River. Dr. Cooper collected many examples, varying much in size, but none so large as those which we have seen from Oregon.

The following is a copy of his note on the specimens,—"The numerous small specimens were found in the dry prairie at the junction of Hell Gate and Bitter Root Rivers, and as I met with larger ones of various sizes in more damp situations of the woods, from an elevation of 4800 feet down to 2200 feet, at the base of the Bitter Root Range, I presume that the former is a dwarfed variety, such as is found also west of the Coast Mountains in Washington Territory. This is the most wide-spread species I have seen." Other specimens forwarded by Dr.

Cooper are labelled, "both slopes of the Bitter Root Mountains from 5600 feet to 2200 feet."

In Binney's Terr. Moll. II. 162, the greatest transverse diameter of Oregon examples, is said to be 1⅜ inch.

The following are the measurements of large and small specimens from Dr. Cooper's shells.

Diam. maj. 23, min. 20, Alt. 13 mil.
" " 17, " 13½, " 9 "

The small variety is generally more strongly and coarsely wrinkled.

Dr. Cooper in the Pacific R. R. Report, gives Puget's Sound, W. T., as a habitat of this species,—it has also been found at Cape Disappointment, on the borders of Oregon and Washington Territory.

Helix Mullani, nov. sp.

T. subobtecte-umbilicatâ, globoso-depressâ, fusco-corneâ, irregulariter striatâ, epidermide tenui, sub lente lineis spiralibus, et tuberculis (setos gerentibus?) munitâ, sub epidermide nitidâ; spirâ brevi; anfr. 5½–6 convexis, ultimo antice gibbo, vix descendente, basi læviusculo, ad aperturam valde constricto; aperturâ subtriangulari, obliquâ, dente brevi, albo, linguiformi, in pariete aperturali intrante subcoarctatâ; perist. albo, vel rufo-corneo, expanso, fornicatim reflexo, bidentato, dentibus duobus albis in margine calli positis, 1 inferiore lamelliformi, altero, sæpe obsoleto, parvo; margine columellari umbilicum mediocrem pervium semioccultante.

Shell with umbilicus partially covered, globose-depressed, dark horn colored, irregularly striated, having a thin epidermis with microscopic spiral lines, and tubercles (the latter with hairs?); beneath the epidermis shining; spire short; whorls 5½ to 6, convex, the last gibbous above, scarcely descending, the base rather smooth, much constricted at the aperture; aperture subtriangular, oblique, with a short white linguiform parietal tooth; peristome white, or reddish horn colored, thickened, expanded, and roundly reflected, with two teeth on the margin of the callus, the lower one lamelliform, the other small, often obsolete, the columellar margin partially covering the middling sized pervious umbilicus.

Diam. maj. 13½, min. 11, Alt. 7 mill.

Station.—Under logs and in dry pine woods.

Habitat.—Dead specimens found near Coeur d'Alêne Mission, Coeur d'Alêne Mountains;—living ones on the west side of the Bitter Root Mountains, Washington Territory, J. G. Cooper!; St. Joseph's River, 1st Camp, Oregon, Cabinet of W. G. Binney.

Remarks.—This species is most nearly allied in form to *H. Columbiana* Lea* (*H. labiosa* Gould), the peristome is however not only more thickened, but also singularly reflected behind the plane of the aperture, producing a canal behind it, leading from the upper margin into the umbilicus. Being tridentate it has some alliance with *H. tridentata* Say, but that shell is of coarser texture, more depressed, has a more open umbilicus, and the form of the peristome and teeth are different.

Dr. Cooper found a beautiful hyaline specimen under a stone "by the Bitter Root River, at an elevation of 4000 feet, on a hill called 'Half Way' 30 miles below the junction." This variety is much depressed, translucent, delicately striated, and has the parietal tooth only. The very thin epidermis shows the spiral lines, and the last whorl numerous scars of the tubercles mentioned in our description of the species. In Mr. Binney's specimen from Oregon the umbilicus is wider, and not so much covered by the peristome as in the other examples.

The species is named in honor of Lieutenant Mullan, U.S.A., who has done much in collecting the natural products of the region in which it was found.

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* A specimen of *H. Columbiana* Lea in the Cabinet of T. Bland, has a well developed parietal tooth, the same as in *H. thyroides* Say.

Helix polygyrella, nov. sp.

T. late umbilicatâ, discoideâ, planulatâ, nitidâ, translucidâ, luteo-corneâ, superne costulatâ, costis ad aperturam obsoletis, basi læviusculâ, spirâ vix elevatâ; anfr. 7–8 convexiusculis, lente accrescentibus, ultimo antice breviter deflexo, intus seriebus duobus remotis trium dentium munito; umbilico ad apicem pervio; aperturâ subverticali, obliquâ, lunato-ovali; perist. superne depresso, albo, simplici, valde incrassato, marginibus dente pliciformi, elevato, albo, triangulari junctis.

Shell widely umbilicate, discoidal, flat, shining, translucent, yellowish horn colored, ribbed above, the ribs obsolete near the aperture, base rather smooth; spire scarcely elevated; whorls 7-8, somewhat convex, gradually increasing, the last slightly deflexed above, armed within with two rows of three teeth, seen through the outer wall; umbilicus pervious, of equal size to the apex; aperture subvertical, oblique, lunate-oval; peristome depressed above, white, simple, much thickened within, the margins joined by a white pliciform elevated triangular tooth.

Diam. maj. 11½, min. 10½, Alt. 5 mill.

Station.—Inhabits moss and decaying wood in the dampest parts of the spruce forests.

Habitat.—Common on the Coeur d'Alêne Mountains, especially on their eastern slope. J. G. Cooper!

Remarks.—This very interesting species is unlike any shell, with which we are acquainted, hitherto found on the North American Continent. Although entirely distinct from the Brazilian *H. polygyrata* Born it has some affinity with it, especially as regards the form generally, and the presence of the internal teeth. *H. polygyrata* has five teeth within the last whorl, three on the under surface of the outer wall, and two opposite to the others on the exterior of the penultimate whorl. Our species has two distinct rows of three teeth, all the teeth being on the under surface of the outer whorl; the first row nearly opposite to the aperture, the second between the first and the parietal tooth; in one specimen, the second row is immediately behind that tooth, and visible through the shell just within the aperture.

Helix Vancouverensis Lea Trans. Amer. Phil. Soc. vi., 87, pl. 23, f. 72.

Mr. Isaac Lea described this from specimens brought by Mr. Nuttall from the banks of the Columbia River, Oregon. In 1840, Dr. Binney (Bost. Jl. iii. 372) considered it the same as *H. concava* Say, although he afterwards (Terr. Moll. ii. 166), in deference to the opinions of others, treated it as distinct. The two are certainly *very* closely allied. Dr. Gould described *H. sportella** (Bost. Proc. ii. 167) in 1846; it was brought by the U. S. Exploring Expedition from Puget Sound, Oregon. Gould's differs from Lea's species in having the incremental striæ more or less decussated by revolving lines, giving it a granulated appearance. In some individuals the decussation is to a great extent obsolete, or confined to the upper whorls only, and it seems to us that the two species cannot be separated. The same differences prevail in forms of the Cuban *H. Sagemon* Beck. *H. vellicata* Forbes is certainly identical with Lea's species.

H. Vancouverensis has a wide distribution. Dr. Cooper collected it "on the west side of the Coeur d'Alêne Mountains, W.T. in the forests of Coniferæ, &c., such as it inhabits west of the Cascade range." He remarks, "there is a wide plain between those two ranges quite uninhabitable by Helices on account of drought, for a distance of about two hundred miles, but this species and *H. Townsendiana Lea* probably extend round its north end through the forests near lat. 49° N." We have it from the vicinity of Crescent City, California (Dr. W.

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* In form and sculpture *H. sportella* is curiously allied to *H. euspira* Pfr. from Venezuela.

Newcomb!), also from Oregon City, and Whidby's Island, W. T.

It is found on the Pacific coast from Puget Sound to San Diego, Lower California.

Helix strigosa Gould Proc. Bost. Soc. N. H. ii. 166.

This species was brought by the U. S. Exploring Expedition from the interior of Oregon.

Dr. Cooper found it in Washington Territory "on the Rocky Mountains by the Bitter Root River, at an elevation of 4000 feet, æstivating under logs of pine, on a steep slope of shale containing lime in veins."

The shells collected by Dr. Cooper are of smaller dimensions than those given by Gould, the former measure diam. maj. 19, min. 17, alt. 7 mill. The outer whorl is more carinated, with a more distinct reddish brown band above, and also below the periphery. In some the penultimate whorl shows at the suture its acutely carinated edge, excavated near the margin, and with an impressed line, as in *H. Cumberlandiana* Lea. The somewhat distant spiral lines at the base, intersecting the incremental striæ, produce a semi-granulated appearance. In old examples the margins of the peristome are joined by a parietal callous deposit.

This species also occurs in the Big Horn Mountains, in Nebraska, and on the Rio Piedra, in W. New Mexico.

One specimen reached us with the animal alive; kept in a glass vessel with moist grass, it deposited six young shells, each having 2–2½ whorls. The species is, it would seem, viviparous.

Helix Cooperi W. G. Binney Proc. Acad. N. S. Phila. 1858, p. 115.

Mr. Binney described this from specimens found by Dr. F. V. Hayden (Yellow Stone River Expl. Exped.), among the Black Hills of Nebraska. We can refer only to this a number of shells collected by Dr. Cooper on the east side of Mullan's Pass, in the Rocky Mountains, W. T., Lat. 46° 30′ N., at an elevation of 5500 feet.

The shells, however, attain a very much larger size than those described by Mr. Binney,—his (5 whorls) are diam. maj. 15, min. 13, alt. 9 mill., whereas Dr. Cooper's specimens (6 whorls) measure diam. maj. 25, min. 23, alt. 12 mill. In those before us the outer whorl is little deflected at the aperture, and the shell, altogether larger, is less globose; the color is also different, Dr. Cooper's examples are generally of a light ash-grey color, the upper part prettily tesselated with reddish brown patches of varied shades, and the last whorl has two bands of the same color, one above and the other below the periphery. The surface in fresh specimens has a granulated appearance, the incremental striæ being crossed by numerous distinct impressed spiral lines.

This species has marked affinities with *H. strigosa* Gould, indeed, on a cursory examination might perhaps pass as a variety, but the difference in color and sculpturing, its more elevated spire, and narrower umbilicus, seem to entitle it to specific distinction.

We find a *colorless worn* specimen, with umbilicus more like that of *H. strigosa*, and which may be an elevated form of that species, or a variety of *H. Cooperi.*

This species also occurs on the Big Horn Mountains, Nebraska; on the west side of the Wind River Mountains; and on the Rio Piedra, W. New Mexico.

Helix solitaria Say Jour. Acad. N. S. Phila. ii., p. 157.

Dr. Cooper collected many specimens on both slopes of the Coeur d'Alêne Mountains, particularly in the bush and fern covered openings in the forests, at elevations exceeding 2500 feet. This well known species inhabits a wide area. Say described a single dead example from Lower Missouri. It occurs also in Michigan, Indiana, and Ohio. A small variety, sometimes without bands, is found on Strontian Island, Lake Erie. One of Dr. Cooper's specimens has a very unusual arrangement of color,—the entire shell is dark reddish brown, with a single pale band at the periphery.

The shell found by Dr. Hayden at Bridger's Pass, Nebraska, and referred to by Mr. W. G. Binney (Proc. Acad. N. S. Phila. 1858, p. 115) as a small variety of *H. solitaria* is evidently the young state of *H. Cooperi* W. G. Binney.

Helix arborea Say Nich. Enc. iv., pl. 4, f. 4.

Dr. Cooper met with this species in damp bottom lands along the lower valley of the Hell Gate River, at an elevation of about 4500 feet. The wide distribution of *H. arborea* is remarkable, it is found from Labrador to Texas, from Florida to Nebraska, also on the Rio Chama in New Mexico. It is likewise said by Beau to inhabit the island of Guadeloupe, West Indies. Férussac, in a letter to Say (1820), the original of which is in the possession of T. Bland, expresses his belief that *H. arborea* is found in Guadeloupe.

Helix striatella Anthony Jl. Bost. Soc. N. H. iii., pl. 3, f. 2.

Dr. Cooper also found this in the same locality as *H. arborea* Say. Its range is from Canada East to Kansas, and from Pembina on the Red River of the North to Virginia.

Succinea rusticana Gould Proc. Bost. Soc. N. H. 1846, p. 187.

This species was brought by the U. S. Exploring Expedition from Oregon. Dr. Cooper collected it on the Rocky Mountains of the Bitter Root Valley, at elevations from 2500 to 4500 feet.

The following fresh water species, as determined with the assistance of Messrs. Lea, Binney, and Prime, were also collected in the mountains by Dr. Cooper:

Melania plicifera Lea	Hell Gate River.
Limnæa fragilis L.	
——— humilis Say	
Physa hypnorum L.	
——— heterostropha Say	
Planorbis trivolvis Say	
——— parvus Say?	
Sphærium occidentale Prime	
Limnæa fragilis L.	Missouri River above the Falls.
——— bulimoides L.	
——— desidiosa S.	
Physa heterostropha S.	
Sphærium striatinum Lam	

Leptoxis.
Amnicola.
Ancylus.
Unio luteolus Lam.
Margaritana margaritifera L.

This latter was found in the "Missouri River above the Falls, and also in the Spokan River below Lake Coeur d'Alêne." It is the purple variety, hitherto only brought from the Pacific coast.

XXXII.—*Analytical Synopsis of the Order of* SQUALI; *and Revision of the Nomenclature of the Genera.*

BY THEODORE GILL.

Read 16th December, 1861.

§ I.

ON THE HISTORY OF THE ORDER.

IN this memoir, the nomenclature and classification of those Vertebrates which constitute the order of SQUALI, or that group of Elasmobranchiates characterized by lateral branchial apertures, and the absence of naso-pectoral cartilages, are discussed. The group so distinguished appears to be marked by features sufficiently important and peculiar to entitle it to the rank of an order distinct from the Rays. Such distinction has already been conferred on it by Prof. Agassiz in his "Essay on Classification." The orders so separated are then really equivalent, according to definition, with the Artedian and Linnæan genera of *Squalus* and *Raia*, although by the reference of the "saw fish" (*Pristis*) to the former, a true representative of the Rays is treated as a shark.

In order to satisfactorily establish the nomenclature of the Elasmobranchiates, it will be necessary to review the principal works in which they have been described, thus ascertaining the forms known to each zoologist, the genera recognised by them, and the limits by definition and inclusion of those genera; it will be then comparatively easy to discover the name which should be retained for each.

The systematic arrangement here adopted is a modification of that of Müller and Henle. The principal differences consist in the arrangement of the *Scyllioids* at another point in the series, and their distribution among three families, and in the union of the Müllerian families of the *Carchariæ*, *Triænodontes*, *Galei*, *Scylliodontes*, and *Musteli* in one, but after the exclusion from the first of the hammer-headed sharks which appear to constitute a distinct family (*Cestraciontoidæ*) recognised as such by most of the recent systematists. The reasons for these changes will be hereafter given. At another time we also hope to be able to give the full characters of the families and their respective subdivisions now adopted.

1.—Artedi was the first to establish and characterize the genera of fishes in the manner of the moderns. In his "Genera Piscium," published under the auspices of Linnæus in 1738, he thus described the genus *Squalus*.

> "*Foramina* Branchiarum utrinque quinque, longitudinaliter à lateribus capitis ad pinnas pectorales sita.
>
> *Caput* plagioplateum, sed corpus oblongum, ambitu vel rotundo vel anguloso. Cutis aspera.
>
> *Oculi* ad latera capitis. Caudæ superior pars inferiore longior.
>
> *Os* plerumque in prona parte capitis seu subtus transversim situm."

The genus thus defined is essentially equivalent to the order of *Squali* as here adopted; some species since discovered do not, however, agree with the above diagnosis, the *Notidanoidæ* having six or seven branchial apertures on each side; but such a structure is abnormal as regards the group, and could not have been anticipated from acquaintance with the forms then known. The *S. pristis* referred to the genus is a Ray and not a Shark. The *Squalus squatina* also departs in three of its characters from those assigned to the genus, but agrees in the essential feature of lateral branchial apertures.

The species placed by Artedi in the genus were the following. The names by which they are now known are given after the Artedian.

Dentibus granulosis præditi.

1. Squalus *rostro longo cuspidato osseo plano utrinque dentato*=Pristis antiquorum *Shaw*.

2. Squalus *dentibus obtusis seu granulosis* = Mustelus lævis Flem.

Dentibus acutis prædití.

Dorso spinoso.

3. Squalus *pinna ani nulla; ambitu corporis subrotundo* = Squalus acanthias *Linn.*
4. Squalus *pinna ani carens; naribus in extremo rostro* = Spinax niger *Cloquet.*
5. Squalus *pinna ani carens; ambitu corporis triangulato* = Oxynotus centrina *Raf.*
6. Squalus *pinna ani carens; ore in apice capitis* = Rhina squatina *Raf.*

Spinis dorsi carentes.

7. Squalus *capite latissimo transverso mallei instar* = Cestracion zygaena *Gill.*
8. Squalus *cauda longiore quam ipsum corpus* = Alopias vulpes *Bon.*
9. Squalus *naribus ori vicinis, foraminibus exiguis ad oculos* = Galeorhinus galeus *Blain.*

Rostris brevioribus.

10. Squalus *ex rufo varius, pinna ani medio inter anum et caudam pinnatum* = Scylliorhinus caniculus, *Bl.*
11. Squalus *dorso vario; pinnis ventralibus concretis* = No. 10.
12. Squalus *cinereus; pinnis ventralibus discretis* = Catulus stellaris *Sm.*

Rostris longioribus.

13. Squalus *fossula triangulari in extremo dorsi, foraminibus nullis ad oculos* = Cynocephalus glaucus *Gill.*
14. Squalus *dorso plano, dentibus plurimis ad latera serratis* = Carcharodon lamia *Bon.*

It has been accepted as a maxim by some modern naturalists, and especially by ornithologists, that the first-mentioned species of a genus should be regarded as its type unless another is expressly affirmed to be such. But even many of the modern naturalists consider that the type should be regarded as the central form, before and after which such variant species as exhibit a greater tendency or affinity to other groups, should be respectively placed. It is at least evident from the examination of the works of the naturalists of the past century that *they* never purposely arranged species with the design of placing a typical one at the head. In the present case, for example, the *Pristis antiquorum* is stationed as the first of the genus, yet it not only *entirely* disagrees with the generic character, but is happily the only one that does so! On the other hand, the generic characters assigned by Artedi to the genus *Raia* are entirely applicable to it. I can scarcely conceive that any one should seriously apply the above-mentioned maxim to the name in question, and urge the acceptance of the *Squalus pristis* as the type of the genus.

2.—Klein,* in 1742, distributed the representatives of the order of Squali among four genera which were essentially distinguished as follows:—

I. Cynocephalus.—Capite rostrato—Ore longitudinaliter fisso.
    1. *C. albus* = Carcharodon lamia.
    2. *C. glaucus* = Cynocephalus glaucus.
    3. *C. rostro brevi.*
II. Galeus S. *Mustelus* capite rostrato; ore transversali, prono.
    1. *G. acanthias* = Squalus acanthias L.
    2. *G. lævis* = Mustelus lævis *Flem.*
    3. *G. rostri extimo parte pellucida* = Galeorhinus galeus *Bl.*
    4. *G. capite rostroque brevissimis* = Scylliorhinus caniculus *Bl.*
    5. *G. cinereus* = Catulus stellaris *Sm.*
    6. *G. dorso pulverulento* = No. 4.
    7. *G. brevis, crassus* = Spinax niger *Cloquet.*
    8. *G. cauda longa* = Alopias vulpes *Bon.*
    9. *G. rostro brevi.*
    10. *G. capite in hyperbolam desinente* = Reniceps tiburo *Gill.*
    11. *G. rostro longo plano, firmo* = Pristis antiquorum *Shaw.*
III. Cestracion.—Capite transverso, ore prono, transversali.
    1. *C. fronte arcus figura* = Cestracion zygæna *Gill.*
    2. *C. capite cordis figura* = Reniceps tiburo *Gill.*

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* Jacobi Theodori Klein, Historiæ Piscium promovendæ missus tertius de piscibus per branchias occultas spirantibus.

IV. RHINA; capite depresso; ore in extremitate.

1. *Rhina* sive Squativa *omnium autorum*=Rhina squatina *Raf.*
2. *Rhina* pedata quasi; cauda in superiori parte tripenni.*

The four genera thus established correspond to the single Artedian genus *Squalus*. The generic names are all new, that of *Squalus* not having been retained for any special group. As that name must be accepted for some one genus, and as no type was mentioned by Artedi, it would then appear that the subdivision containing some species of the Artedian *Squalus* conforming to the original diagnosis, should retain the name restricted to it by the first succeeding naturalist, and that the name of Klein's group equivalent to, or embracing that subdivision, should be regarded as a synonyme.

As will be hereafter shown, Rafinesque was the first to restrict the Artedian genus by confining it to those species without an anal fin—the first species of Linnæus. Klein's *Galeus* embracing such, that name will then be considered as a synonyme.

The characters assigned by Klein as distinctive of his *Cynocephalus* and *Galeus* have nothing like the relative importance attributed to them, nor have his principles been strictly applied, since several of his *Galei* have mouths whose fissures are nearly as long as in his *Cynocephalus*. Still, as the two are founded on actual characters, *Cynocephalus* should apparently be retained as a generic appellation.

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* The second species, of *Rhina*, regarded by Klein himself as problematical and factitious, was founded on an *extraordinary description* of an animal exhibited in London in September, 1737, having a "fin on each shoulder in shape something like the wings of a cherubim." Autor hunc piscem pro *Sirene* Antiquorum agnoscit; qui in anno 1737, mense Septembri captus et Londini expositus fuit; sed vereor, ne lucri causa mentulæ distortæ et in pedum simulacra, ope fili ferrei vel aenei, efformatæ fuerint; adeo hujus piscis descriptio convenit cum præcedenti; nisi quod tres pinnas in cauda, et quasi pedes habeat. The three fins on the tail, doubtless, included the caudal. The "feet" were likewise, probably, the sexual organs of the male.

3.—Next in order of time, succeeds the revised classification of Linnæus.

In the first nine editions of the "Systema Naturæ" is adopted the arrangement of Artedi. In the tenth edition (1758), he proposed the following modification.

* Dorso spinoso; pinna ani nulla.

1. S. acanthias.
2. S. centrina=Oxynotus centrina *Raf.*
3. S. spinax=Spinax niger *Cloquet.*
4. S. squatina=Rhina squatina *Raf.*

* * Dorso mutico, dentibus acutis; cum pinna ani.

5. S. zygaena=Cestracion zygaena *Gill.*
6. S. tiburo=Reniceps tiburo *Gill.*
7. S. galeus=Galeorhinus galeus *Bl.*
8. S. canicula=Scylliorhinus caniculus *Blain.*
9. S. catulus=No. 8.
10. S. stellaris=Catulus stellaris *Sm.*
11. S. glaucus=Cynocephalus glaucus *Gill.*
12. S. carcharias=Carcharodon lamia *Bon.*

* * * Dentibus granulatis.

13. S. mustelus=Mustelus lævis *Flem.*
14. S. pristis=Pristis antiquorum *Shaw.*

This arrangement is essentially similar to that of Artedi, the chief difference consisting in the different distribution of some of the species, and especially in the placing of S. *acanthias* as the first of the genus and the deferring of S. *pristis* to the last.

4.—Lacépède proposed a fictitious genus on the supposed absence of teeth, under the name of Aodon, but *Squalus* itself remained unaltered.

5.—Dumeril, in his "Zoologie Analytique," established the genus *Squatina* for the *Squalus squatina* of Linnæus, a species which had already been taken for the *Rhina* of Klein. His characters were thus given—

With teeth; pectoral fins nicked,	Squatina.
With teeth; pectoral fins entire,	Squalus.
Without teeth,	Aodon.

6.—The first naturalist who introduced decided innovations or improvements in the arrangement of the *Squali* was Rafinesque. In a work* published in 1810, in Sicily, he indicated the following new genera and species. The names which it is believed should be retained for them, when different from those used by Rafinesque, are also given.

Carcharias taurus	Odontaspis taurus.
Dalatias sparophagus	Scymnus lichia.
" nocturnus	Squalus acanthias.
Tetroras angiova	Cetorhinus maximus.
Isurus oxyrhinchus	———
Cerictius macrourus	Unknown.
Alopias macrourus	Alopias vulpes.
Heptranchias cinereus	———
Galeus melastomus	Pristiurus melanostomus.
Squalus uyato	———
Hexanchus griseus	———
Etmopterus aculeatus	Spinax niger.
Rhina squatina	———

7.—A short time afterwards, in the "Indice d'ittiologia siciliana," he named and characterized two more genera founded on formerly known species. They are the following:—

Oxynotus centrina	———
Sphyrna zygæna	Cestracion zygæna.

The distinctive characters given by Rafinesque to his genera are exhibited in the following analytical synopsis.

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* *Caratteri di alcuni Nuovi Generi, e nuovi specie di Animali e piante della Sicilia.* Palermo, 1810.

I. Anal fin present.	
A. Dorsal fins two.	
B. Caudal fin with its upper lobe elongated.	
Caudal with a moderately elongated upper lobe.	
Head unarmed above.	
Head normally shaped.	
Branchial apertures 5.	
Spiracles present.	*Galeus.*
Spiracles (obsolete).	Carcharias.
(Branchial apertures 4).	Tetroras.
Head hammer-shaped.	*Sphyrna.*
"Head armed with two horns above the eyes."	Cerictius.
Caudal with upper lobe very long. Second dorsal and anal fins small and adipose.	*Alopias.*
BB. Caudal fin lunate.	*Isurus.*
AA. Dorsal fin single.	
Branchial apertures six.	*Hexanchus.*
Branchial apertures seven.	*Heptranchias.*
II. Anal fin absent. Dorsal fins two.	
Branchial apertures 5.	
Spiracles present.	*Squalus.*
"Spiracles absent."	Dalatias.
"Branchial apertures 3." Dorsal fins laciniated.	Etmopterus.

Rafinesque, in this classification, advanced in many respects decidedly ahead of his predecessors, and the characters that he has assigned to seven of the genera are mainly correct; the names of those so distinguished are indicated in italics.

Of the other forms, his *Carcharias taurus*, which was the only species at first referred by him to the genus, and which must consequently be regarded as its type, has spiracles; as the *sole* character which he considered as distinguishing the genus from *Galeus* is thus fallacious, and as it *originated entirely from misapprehension*, the name should apparently not be accepted, as, had it not been for that error, Rafinesque would have referred the species to *Galeus*. The acceptance of Rafinesque's name would be equivalent to the offer of a premium for carelessness and inaccuracy, for which that author was so notoriously distinguished.

His *Tetroras angiova* has been regarded by the Prince of Canino as a synonyme of *Notidanus* (or *Heptranchias*) *cinereus*, but such cannot be the case, as the character "*due ale dorsali*" at once demonstrates. The notice of the dentition (*denti in forma di raspo*), of the large branchial apertures (*l'aperture della branche bastantemente larghe*), and of the caudal carina (*un appendice ad ogni lato della coda*), as well as of the color (*bigio nerastro*), and small eyes (*occhi piccolissimo*), can only refer to the *Cetorhinus maximus* of Blainville, or the great basking shark, or at least a species of that genus. The attribute of four branchial apertures is of course incorrect.

Cerictius is doubtless founded on factitious specimens.

Dalatias is synonymous with *Squalus*, the large spiracles having been overlooked.

The *Etmopterus aculeatus* is apparently founded on the *Spinax niger*, whose fins, like those of other species of the genus, exhibit a tendency to become cleft and laciniated, giving them somewhat of a rayed appearance. It is true that *Spinax* has the teeth of the lower jaw subquadrate, with an almost horizontal incisorial edge, and those of the upper jaw cuspidate and pointed as in *Scyllium*, while Rafinesque attributes to his species only pointed teeth (*i denti piccoli ed acuti*), and three branchial apertures (*tri branchie da ogni lato della testa*); but—*Rafinesque describes!*

8.—Blainville next, in 1816, published his views on the classification of the sharks, in which he distributed the genera in the following manner:—

1. Scylliorhinus (canicula).
2. Echinorhinus (spinosus).
3. Monopterhinus (griseus).
4. Galeorhinus (mustelus, galeus, etc.)
5. Acanthorhinus (acanthias).

6. Heterodontes (Philippii).
7. Carcharinus (Commersonii).
8. Cestrorhinus (zygæna).
9. Cetorhinus (Gunneri).

9.—In the following year Cuvier, in his Regne Animal, proposed the ensuing division.

I. Les Squales (Squalus L.).
  Les Roussettes (Scyllium Cuv.).
  Squales proprement dits.
    Espèces sans évents, pourvues d'une anale.
  Les Requins (Carcharias Cuv.).
  Les Lamies ou Tonilles (Lamna Cuv.).
  Les Marteaux (Zygaena Cuv.).
    Espèces réunissant des évents et une anale.
  Les Milandres (Galeus Cuv.).
  Les Emissoles (Mustelus Cuv.).
  Les Grisets (Notidanus Cuv.).
  Les Pelerins (Selache Cuv.).
  Les Cestracions (Cestracion Cuv.).
    Espèces sans anale, mais pourvue d'évents.
  Les Aiguillats (Spinax Cuv.).
  Les Humantins (Centrina Cuv.).
  Les Leiches (Scymnus Cuv.).
II. Les Anges (Squatina Dumér.).

Four of the genera thus proposed are adopted in the following analytical synopsis, although by some, all of them have been regarded as synonyms of previously established ones. They are *Lamna* (*Isurus* Raf.), *Mustelus* (*Galeorhinus* Bl.), *Spinax* (*Acanthorhinus* Bl.), and *Scymnus* (*Dalatias* Gray).

10.—In 1829, in the fourth edition of the Regne Animal, Cuvier rather modified than improved his classification of the Squali by the elevation of *Zygæna* to full generic rank, and its interposition between *Squalus* and *Squatina*.

11.—In the third year-book of the "Archiv für Naturgeschichte" (1837), and in the second volume of the Magazine of Natural History (new series), a sketch of the arrangement of the Plagistomes is given by Müller and Henle. They thus distributed the various forms known to them:

§ 1. Two dorsals and one anal; first dorsal above or behind ventrals.

Family SCYLLIA. *Pristiurus* Bon., *Chiloscyllium* MH., *Hemiscyllium* MH., *Crossorhinus* MH., *Ginglymostoma* MH., *Stegostoma* MH.

§ 2. Two dorsals and one anal; first dorsal in front of ventrals.

(Family NICTITANTES).

A. Without spiracles.
  a. Teeth flat, sharp, the edges serrated or smooth.
    1. *Carcharias.* 2. *Scoliodon* MH. 3. *Zygæna.*
  b. Teeth pointed, with lateral denticles, like the teeth of *Scyllium.*
    1. *Triænodon* MH. *Leptocharias* Andr. Smith.
B. Possessing spiracles.
  a. Teeth, flat, sharp, serrated or not serrated.
    1. *Galeocerdo* MH. 2. *Loxodon* MH. 3. *Galeus* MH.
  b. Teeth pointed, as in *Scyllium.*
    Triakis MH.
  c. Teeth pavement-like, or presenting a general continuity of surface, as in the Skates.
    Mustelus.

Family LAMNOIDEA.
  1. *Lamna.* 2. *Oxyrhina* Agass. 3. *Carcharodon* Smith. 4. *Selache.* 5. *Rineodon* Smith.

Family (ODONTASPIDES). *Triglochis* MH.

Family (ALOPECIÆ) *Alopecias* MH.

Family (CESTRACIONTES) *Cestracion.*

§ 3. One dorsal and one anal.

Family (NOTIDANI) *Hexanchus* Raf. *Heptanchus* Raf.

§ 4. No anal.

Group with dorsal stings (*Acanthorhinus* Blainv.).
  1. *Acanthias* Bonap. 2. *Spinax* Bonap. 3. *Centrina* Cuv. 4. *Centrophorus* MH.

Group without dorsal stings (*Scymnus* Cuv.).

1. *Scymnus* MH. 2. *Læmargus* MH. 3. *Echinorhinus* Blainv.

§ 5. No anal; mouth terminal.

(Family Squatinæ) *Squatina.*

The principal feature in this classification is the great increase in the number of families. All the sharks had been previously regarded as members of a single family, while here they are divided among nine or ten. The authors have not, in their first memoirs, named many of these families, and have even failed to indicate a couple as such; the appellations of those added in parentheses are adopted from their great work.

The classification deserves every praise, and is certainly a great improvement on the previous ones. The genera are more rigidly circumscribed and more naturally approximated than had been before done, and all the families appear to be entitled to such rank. The division of the sharks with nictitating membranes into five families, as was afterwards proposed, appears to be unwarranted. Here, too, the Plagiostomes were, for the first time, divided into two sub-orders, and the true characters assigned to them; but notwithstanding, *Pristiophorus*, which agrees in all its characters with the Squali, was placed among the Rays.

12.—Shortly after, the same naturalists published their "Systematische Beschreibung der Plagiostomen," in which they modified their previous arrangement.

I. section. Sharks with two dorsal fins and an anal fin; the first dorsal over or behind the ventrals.

One family, Scyllia.

I. Scyllium. II. Pristiurus Bonap. III. Hemiscyllium. IV. Chiloscyllium. V. Crossorhinus. VI. Ginglymostoma. VII. Stegostoma.

II. section. Sharks with two dorsal fins and an anal; first dorsal between the pectorals and ventrals.

First sub-section. With a nictitating membrane and without spiracles.

First family, CARCHARIÆ.

I. Carcharias (1. Sub-genus Scoliodon; 2. Sub-genus Physodon Valenc.; 3. Sub-genus Aprion; 4. Sub-genus Hypoprion; 5. Sub-genus Prionodon). II. Sphyrna Raf.

Second family, TRIÆNODONTES. I. Triænodon.

Second sub-section. With a nictitating membrane and spiracles.

First family, GALEI.

I. Galeus Cuv. II. Galeocerdo. III. Loxodon. IV. Thalassorhinus Valenc.

Second family, SCYLLIODONTES. I. Triakis.

Third family, MUSTELI. I. Mustelus.

Third sub-section. Without nictitating membrane; with spiracles.

First family, LAMNÆ.

I. Lamna Cuv. II. Oxyrhina Agass. III. Carcharodon Smith. IV. Selache Cuv.

Second family, ODONTASPIDES. I. Odontaspis Agass.

Third family, ALOPECIÆ. I. Alopias Raf.

Fourth family, CESTRACIONTES. I. Cestracion Cuv.

Fifth family, RHINODONTES. I. Rhinodon Smith.

III. section. Sharks with an anal and a single dorsal fin.

One family, NOTIDANI.

I. Hexanchus Raf. II. Heptanchus Raf.

IV. section. Sharks without an anal fin.

First family, SPINACES.

I. Acanthias Bonap. II. Spinax Bonap. III. Centrina Cuv. IV. Centrophorus. V. Centroscyllium.

Second family, SCYMNI.

I. Scymnus (1. Sub-genus Scymnus; 2. Sub-genus Læmargus). II. Echinorhinus de Blainv. III. Pristiophorus.

Third family, SQUATINÆ. I. Squatina Dum.

The principal innovations in this arrangement of their previous one, are the transference of the genus *Pristiphorus* to the sub-order of Squali and the family of Scymni, the subdivision of the sharks with a nictitating membrane into five families, the more positive circumscription of the families, and the creation of a distinct one for *Rhinodon*. The name of *Odontaspis* proposed by Agassiz is substituted for their subsequent one of *Triglochis; Leptocharias* is re-united to *Triænodon*,—erroneously, I believe; and *Carcharias* is subdivided into five sub-genera, to which rank *Scoliodon* is also degraded. The reference of *Pristiophorus* to the Squali is a most important improvement. On the other hand, the right of the five families of the sharks with nictitating membranes to such rank is more than doubtful. The work is altogether worthy of the illustrious anatomists by whom it was published, and marks a new era in the history of the class. The characters of the families, genera, and species, were given with a precision and correctness previously unparalleled, numerous additions were made to the known forms, and the synonymy has been much more correctly digested than had been previously done. The serial arrangement proposed by them has been adopted by almost all succeeding selachologists, and the chief variations consist in the different relative value assigned to the various groups of Nictitantes, as well as to that section as a whole, and the position assigned to the hammer-headed sharks. Those modifications will be exhibited in the succeeding synopsis of the classifications of different naturalists.

13.—Mr. Swainson, in "The Natural History of Fishes, Amphibians, and Reptiles or Monocardian Animals"* (1839), proposed the following classification. The generic names in italics indicate *sub-genera* of those genera printed in roman characters which precede them.

Order III. CARTILAGINES. *Cartilaginous Fishes.*
Family I. SQUALIDÆ. *Sharks.*
1. Sub-fam. SQUALINÆ. *Typical Sharks.*
Squalus *Linn.*, *Alopias* Raf., *Cerictius* Raf.—Dalatias *Raf.*—Selachus. *Isurus* Raf., *Selachus* Cuv., *Lamna* Cuv.—Rhineodon *Smith*,

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* Part II. The natural arrangement of the classes of Fishes, Amphibians, and Reptiles (pp. 312–319): also Vol. I. pp. 127–168, and Vol. II. pp. 191, 192, where they are somewhat differently arranged!

Tetroras Raf., *Heptranchias* Raf., *Scoliodon* Müll. and Hen., *Leptocharias* Smith.

2. Sub-fam. CENTRININÆ.

Centrina. *Centrina* Cuv., *Spinax* Cuv., *Etmopterus* Raf., *Scynnus* Cuv., *Centrophorus* Müller and Henle—Galeus *Antiq. Raf.*,—Scyllium *Cuv.*—Cestracion *Cuv.*—Mustelus *Raf.*

Spiraculated Sharks, whose natural affinities are uncertain, and whose rank as sub-genera or aberrant species has not been ascertained.

Hexanchus Raf., *Galeocerdo* M. and H., *Oxyrhina* Agass., *Rhiniodon* Smith, *Pristiurus* Bon., *Chiloscyllium* M. and H., *Loxodon* M. and H., *Triglochis* M. and H., *Alopecias* M. and H.

3. Sub-fam. ZYGANINÆ.

Zygana *Antiq.*, *Platysqualus* Sw.

4. Sub-fam. CROSSORHINÆ.

Crossorhinus *M. and H.*

5. Sub-fam. PRISTINÆ.

Pristis *Latham.*

Family 2. RAIDÆ. *Rays, Skates, Thornbacks.*

4. Sub-fam. SQUATINÆ.

Squatina *Dum.*

Mr. Swainson's classification is *the* natural system. Mr. Swainson affirms this, and has elsewhere decided that Cuvier "was totally unacquainted with the very first principles of the natural system;" in a note on *Chiloscyllium*, he observes that he had "before expressed [his] opinion on the very artificial nature of the arrangement of the cartilaginous fishes by Müller and Henle." We had, unfortunately, almost overlooked at first the system of the learned philosopher! but on account of its imposing nature and proportions, it cannot be neglected. No charge of plagiarism can be brought against it; it is the most original arrangement of the sharks that has ever been proposed, and in every respect worthy of that Rafinesque whose genera are all adopted in it. All other naturalists have regarded as belonging to the same species, forms which are taken in the "*natural arrangement*," as representatives of distinct genera in different sub-families: Rafinesque and Swainson have alone the merit of separating them!

14.—Prof. Richard Owen, in his "Lectures on the Comparative Anatomy and Physiology of the Vertebrate Animals, delivered at the Royal College of Surgeons of England, in 1844 and 1846," accepted the order of Plagiostomi without its division into sub-orders, and adopted the following families of sharks.

Hybodontidæ	Example, Hybodus.
Cestraciontidæ	Cestracion.
Notidanidæ	Grey shark.
Spinacidæ	Piked dog fish.
Scylliidæ	Dog fish.
Nictitantes	Tope.
Lamnidæ	Porbeagle.
Alopeciidæ	Fox-shark.
Scymniidæ	Greenland-shark.
Squatinidæ	Monk fish.
Zygænidæ	Hammer-head shark.

The arrangement thus resembles the first classification of Müller and Henle, rather than the second, in the preservation of the Nictitantes or sharks with the nictitating membrane as a true family. The Odontaspides appear also to be considered as Lamnidæ. But the principal difference is the position of the Zygænidæ at the end of the sharks, where they had been before almost placed by Cuvier in the second edition (1829) of his Regne Animal,—for the latter had only placed after them the Squatinæ. This position of the Zygænidæ does not appear to be natural, as those fishes are evidently very nearly allied to the other Nictitantes, differing only in the lateral development of the head, and the modifications necessarily induced thereby. The highest rank to which they are entitled is that of a family nearly allied to the Nictitantes with the normal squaloid form.

15.—In 1851, a "List of the Specimens of Fish in the Collection of the British Museum, Part I. Chondropterygii," was published by that institution. The name of the author is not given on the title-page. Dr. John Edward Gray, in the introduction, states that the specimens of the Sharks and Rays which were not named by Messrs. Müller and Henle when engaged in their work, or by Dr. Andrew Smith, "have been determined by Mr. Edward Gerrard, who has paid considerable attention to this subject, and has compared several of the specimens with the authentic types contained in the Paris collection." The work, however, bears internal evidence that Mr. Gray is responsible for the letter-press. The arrangement is essentially that of Müller and Henle's "Systematische Beschreibung;" but the families of those naturalists are regarded as simple tribes, only three families being adopted, the *Scylliadæ* or *Scyllii* of Müller and Henle, the *Squalidæ*, and the *Squatinidæ*. The arrangement also differs from the latest one of Müller and Henle by the retention of the genus *Pristiophorus* in the "section" of the *Raii* and the family of *Pristisidæ*. The characters of the tribes and genera are translated from the great work of Müller and Henle, and the species are simply named and not described. As the names of several of the genera have been changed, the following sketch of the catalogue may be useful; the names of Müller and Henle are inclosed in parentheses.

Order CHONDROPTERYGII.
Sub-order II. TREMATOPNEA.
Sect. I. SQUALI.
Fam. 1. SCYLLIADÆ.
  1. Scyllium. 2. Pristidurus. 3. Hemiscyllium. 4. Chiloscyllium. 5. Crossorhinus. 6. Nebrius (*Rüp.*=Ginglymostoma *M. & H.*). 6. Stegostoma.
Fam. 2. SQUALIDÆ.
  I. *Squaliana*. 1. Squalus **Scoliodon* ***Triglochis*(!=*Physodon* M. & H.) ****Aprion* *****Hypoprion* ***** *Carcharinus* (=*Prionodon*). 2. Sphyrnias (=Sphyrna).

II. *Leptochariana.* Leptocharias (=Trisenodon).

III. *Galeiana.* 1. Galeus. 2. Galeocerdo. 3. Loxodon. 4. Thalassorhinus.

IV. *Triakiana.* 1. Triakis.

V. *Musteliana.* 1. Mustelus.

VI. *Isurina.* Isurus (*Raf.*=Lamna *C.*). 2. Oxyrhina. 3. Carcharodon. 4. Cetorhinus (*Bl.*=Selache *Cuv.*).

VII. *Odontaspidiana.* Odontaspis.

VIII. *Alopeciana.* 1. Alopias (*R*=Alopecias *M. & H.*).

IX. *Heterodontina.* 1. Heterodontus (*Bl.*=Cestracion *Cuv.*).

X. *Rhineodontiana.* 1. Rhinodon.

XI. *Hexanchina.* 1. Hexanchus. 2. Heptranchus (=Heptanchus *M. & H.*).

XII. *Acantiana.* 1. Acanthias. 2. Spinax. 3. Oxynotus (*R.*=Centrina *Cuv.*). 4. Acanthorhinus (*Bl.*=Centrophorus *M. & H.*). 5. Centroscyllium.

XIII. *Dalatiana.* 1. Dalatias (=Scymnus *Cuv.*) a *Dalatias* (= *Scymnus M. & H.*) *Somniosus* (Les=*Laemargus M. & H.*). 2. Echinorhinus.

Fam. 3. SQUATINIDÆ.

1. Squatina.

Sect. II. RAII.

Fam. 4. PRISTISIDÆ.

1. Pristiophorus. 2. Pristis.

On account of the consideration of the Scyllioids as a "family" or group, equivalent to the combination of the others—except the Squatinidæ which constitute a third family—and by the retention of *Pristiophorus* in the "section" of the Rays, this arrangement departs from that of Müller and Henle, and is correspondingly erroneous. *Pristiophorus* entirely agrees with the characters of the *Squali* as retained by Gray, and equally disagrees with those of the *Raiæ.* Its resemblance to *Pristis* is remote and simply analogical, not indicative of true affinity. *Pristis* is in every respect a true Ray. The restoration of some of the names appears also to have been proposed without due consideration. The work itself is a useful one, and not only contains the translations of the characters of the groups of Müller and Henle, but the synonymy is copied with some additions, and is very full and generally reliable; a review is also given of some of the previous arrangements of these fishes.

16.—M. A. Duméril, in a monograph of the Scyllioids,* proposed the division of the sub-order of Squali, which he regarded as a family, into four tribes, equivalent to the sections of Müller and Henle, whose characters he thus expressed.

				Groups.
Anal fin.	distinct, dorsal	two; the first	above or behind the ventrals .	I
			between the ventrals and pectorals.	II
		one	. . . .	III
	none		. . . .	IV

17.—Sir John Richardson, in the essay on "Ichthyology," in the last edition of the "Encyclopædia Britannica," adopted the following arrangement.

(A.) Sharks, with an anal fin and the dorsals far back; the first being behind the ventrals.

Family I. Scylliidæ=Scyllii *Müller* and *Henle.*

(B.) Sharks, with two dorsals and an anal; the first dorsal over the space between the pectorals and ventrals. A nictitating membrane. No spout holes; the last two gill openings over the pectoral.

Family II. Carcharidæ.

Genera. I. Carcharias *Müller* and *Henle.* (Sub-genera I. Scoliodon. II. Physodon. III. Aprion. IV. Hypoprion. V. Prionodon.) II. Prionodon *Müll.* and *Henle.* The last name has been inadvertently substituted for *Triænodon.*

(C.) Sharks, with two dorsals and an anal; first dorsal between the pectorals and ventrals. A nictitating membrane. Spout holes. The last two gill openings over the pectoral.

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* Monographie de la tribu des Scylliens ou Roussettes (Poissons Plagiostomes), comprenant deux espèces nouvelles, par M. le docteur Auguste Duméril *in* Revue et Magasin de Zoologie pure et appliquée, 2e série—t. v.—1853, pp. 8, 73, 90, 119.

Family III. Galeidæ=Galei, Scylliodontes, Musteli *Müll.* and *Henle.*

(D.) Sharks, with two dorsals and anal; the first dorsal over the space between the pectorals and ventrals. Spout holes, but no nictitating membrane.

Family IV. Lamnidæ=Lamnæ, Odontaspides *Müll.* and *Henle.*

Family V. Alopeciidæ=Alopeciæ *Müll.* and *Henle.*

Family VI. Cestraciontidæ=Cestraciontes *Müll.* and *Henle.*

Family VII. Rhinodontidæ=Rhinodontes *Müll.* and *Henle.*

(E.) Sharks, with one anal and only one dorsal.

Family VIII. Notidenidæ=Notidani *Müll.* and *Henle.*

(F.) Sharks, with spout-holes. Two dorsals; no anal; no nictitating membrane. Five gill-openings, all before the pectorals. Intestinal valve spiral.

Family IX. Spinacidæ=Spinaces *Müll.* and *Henle.*

Family X. Scymnidæ=Scymni *Müll.* and *Henle.*

Family XI. Squatinidæ=Squatinæ *Müll.* and *Henle.*

(G.) Sharks, similar to those of division B. in having a nictitating membrane and no spout holes, and in the position of the spineless dorsals; but with a lateral extension of the skull at the orbits which is greatest in the adults.

Family XII. Zygænidæ.

This distribution, if we except the division of the Nictitantes into two families, is similar to that of Owen; it differs from the one of Müller and Henle by the union of the families of the first and second divisions of the second section into families corresponding to those sections, after the exclusion of the hammer-headed sharks. The latter are retained as a family at the end of the sub-order of Squali. The genus *Hemigaleus*, of Bleeker, has been rather carelessly placed among the Torpedinoidæ.*

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* The family of Torpedinoidæ or Narcaciontoidæ may be thus arranged.

Disk pyriform, formed by the union of the true disk with the ventrals, which are united beneath the tail. Tail very short. Head emarginated in front. Spiracles far behind eyes. Teeth with three points. HYPNINÆ

Dorsals two. Hypnos

18.—Dr. Bleeker in his "Systematis Piscium Naturalis Tentamen," retained the sharks as a sub-order (*Squalini*) of the order of *Plagiostomi*, which formed the fourth order of fishes and the first of the third legion or *Elasmobranchii*. Two orders were embraced in the latter group, the *Plagiostomi*, with the two orders of Squalini and Rajini, and the *Holocephali*.

The Squali were thus sub-divided :—

Sectio I. Proktopterides.
  Tribus I. Dinotopterini.
    FAMILIA 5. SCYLLIOIDEI=SCYLLINI Bp.=SCYLLIA MH.
      Gen. Scyllium MH., *Thyellina* Münst. (foss.), Pristiurus Bp., Chiloscyllium MH., Ginglymostoma MH., Stegostoma MH., *Scylliodus* Ag. (foss.), an huj. loc?
    Familia 6. Carcharoidei=Carchariæ MH.=Carcharidæ Richd.
      Gen. Carcharias MH., Leptocarias Smith, *Glyphis* Ag., Triænodon MH.
    Familia 7. Zygænoidei=Zyganinæ Swns.=Zygænidæ Richd.
      Gen. Zygæna Cuv.=Sphyrna Raf.
    Familia 8. Galeoidei=Galeidæ Richds.

Disk and tail nearly equal. Head emarginated in front. Spiracles far behind eyes. Teeth transverse, with one point.	NARCACIONTINÆ.
Spiracles with dentated borders.	Narcacion.
Spiracles with smooth borders (*Torpedo occidentalis* St.).	Tetronarce.
Disk and tail nearly equally long; Head entire or convex in front. Spiracles close behind eyes. Teeth rhombic or hexagonal.	NARCININÆ.
Dorsals two.	
Ventrals united beneath the tail. Teeth rhombic, acute behind.	*Discopygæ.*
Disk orbicular.	Discopyge.
Ventrals separated. Teeth rhombic, with a median point.	*Narcinæ.*
Nasal valve with single median lobe; snout convex.	Narcine.
Nasal valve tri-lobed.	
Disk sub-circular (*Narcine Timlei* Henle).	Cyclonarce.
Disk pentagonal (*Narcine Indica* Henle).	Gonionarce.
Dorsal single. Teeth rhombic, each with a median point.	*Astrapæ.*
Disk sub-circular.	Astrape.
Dorsal obsolete. Teeth hexagonal and flat.	*Temeræ.*
Disk sub-circular.	Temera.

Gen. Galeus Cuv., Hemigaleus Blkr., Galeocerdo MH., Loxodon MH., Thalassorhinus Val., Triakis MH., Mustelus Art., *Corax* Ag. (foss.) et *Aellopas* Ag. (foss.) an huj. loc.?

Familia 9. Lamnoidei = Lamnini Bp. = Lamnæ MH. = Lamnidæ Richds.

Gen. Isurus Raf., Oxyrhina Ag., Carcharodon MH., Selache Cuv., Odontaspis Ag., *Otodus* Ag., *Sphenodus* Ag., et *Oxytes* Gieb. an hujus loci?

Familia 10. Hybodontoidei = Hybodontes Ag. (foss.).

Gen. *Hybodus* Ag., *Cladodus* Ag., *Sphenonchus* Ag., *Diplodus* Ag., *Glossodus* M'Coy.

Familia 11. Alopecoidei = Alopiadini Bp. = Alopeciæ MH. = Alopecidæ Richds.

Gen. Alopecias MH.

FAMILIA 12. CESTRACIONOIDEI = CESTRACIONTES Ag. = CESTRACIONTINI Bp. = CESTRACIONTIDÆ Richds.

Gen. Cestracion Cuv., et gens. fossilia *Strophodus* Ag., *Acrodus* Ag., *Thectodus* Plien., *Wodnika* Münst., *Petrodus* M'Coy, *Orodus* Ag., *Ctenoptychius* Ag., *Centrodus* Gieb., *Ptychodus* Ag., *Chromatodus* Ag., *Helodus* Ag., *Campodus* DeKon, *Cochliodus* Ag., *Ceratodus* Ag., *Chirodus* M'Coy, *Pleurodus* Ag., *Polyrrhizodus* McCoy, *Dictæa* Munst., *Petalodus* Ov., *Carcharopsis* Ag.

Familia 13. Rhinodontoidei = Rhinodontes MH. = RHINODONTIDÆ Richds.

Gen. Rhinodon Smith.

TRIBUS II. MONOPTERINI.

Familia 14. NOTIDANOIDEI = NOTIDANINI Bp. = NOTIDANI MH. = NOTIDANIDÆ Richds.

Gen. Hexanchus Raf., Heptanchus Raf.

Sectio 2. Aproktopterides.

Familia 15. Centrophoroidei = Spinacini Bp., Spinaces MH. = Spinacidæ Richds.

Gen. Acanthias Bp., Spinax Bp., Centrina Cuv., Centrophodus MH., Centroscyllium MH.

Familia 16. Scymnoidei = Scymnini Bp. = Scymni MH. = Scymnidæ Richds.

Gen. Scymnus Cuv., Læmargus MH., Echinorhinus Bl.

Familia 17. Squatinoidei = Squatinini Bp. = Squatinæ Swns. = Squatinidæ Richds.

Gen. Squatina Dum., *Radamas* Münst., *Xeracanthus* Beyrich.

Familia 18. Pristiophoroidei.

Gen. Pristiophorus MH.

Gen. famil. dub. fossil: *Chilodus* Gieb., *Hemipristis* Ag., *Gomphodus* Reuss, *Ancistrodon* Debey.

At the end of the order are inserted the generic names of many ichthyodorulites.

In this classification, the extinct genera, as well as the recent ones, are included. The former are indicated by the names printed in italics. As they have been mostly founded only on fragments, and especially the teeth, their proper place is often doubtful, as there is no certain correlation between the modifications of structure and dentition, as is the case with the mammals. As will be apparent from the study of the order, nearly or quite the same dentition is observable in very different families, while very decided differences of dentition may occur in one group whose aggregation of characters indicates it to be a natural family, as such is now generally understood by selachologists. The classification of Dr. Bleeker is, however, at least valuable, as being suggestive of their relations, and is, therefore, transcribed for the benefit of those who may not have access to the original work. The families adopted, as well as the order followed, are mostly similar to the classification of Richardson; the principal difference is the sequence of the family of Zygænoidei after the Carcharoidei, in which respect it more resembles Müller and Henle's. The "tribes" and "sections" of Dr. Bleeker do not appear to indicate any modifications of structure of paramount importance, and the section of "Aprokpterides" is scarcely natural. There can hardly be a doubt that the Squatinoidei are the most aberrant as to positive characters, of any of the sharks, and that if a subdivision is made, those fishes are entitled to the rank.

19.—In a "Catalogue of the Fishes of the Eastern Coast of North America," the present author adopted the order of Plagiostomi entire, and proposed to subdivide it into four sub-orders—Squali, Rhinæ, Pristes, and Raiæ, thus essentially preserving the arrangement of Cuvier by raising his four great genera to sub-ordinal rank and considering his sub-genera as families. But the sub-orders thus constituted are of very unequal value, as the differences existing between the first and the last pairs are of much greater importance than those between the two of each respective pair. I am also convinced that the *Pristoidæ* cannot be separated from the Rhinobatoidæ, but must be retained in the same sub-order, and that if there should be any distinction of sub-orders, it cannot be that of Pristes and Raiæ. The former may be, indeed, almost said to be Rhinobatoidæ with a saw-like snout, and the presence or absence of the ensiform appendage is surely insufficient to designate sub-orders.

§ II.

ON THE RELATIONS OF THE ORDER.

The principal features by which the Sharks are distinguished from the Rays, are the position of the branchial apertures on the side of the neck, the incomplete scapular arch, and the absence of naso-pectoral cartilages.

Other peculiar characters, more or less general, are the sub-fusiform or sub-cylindrical shape of the body; the abrupt flexion of the caudal portion of the vertebral column upwards, and the consequent heterocercal condition of the fin; the very convex outline of the cleft of the mouth; the well developed teeth; and the presence of an anal fin.

An example of the ordinary squaloid form is found in the common blue sharks, or species of the Cuvierian genus *Carcharias.* In them, the caudal portion of the vertebral column is moderately elongated and bent upwards; the fin beneath is correspondingly oblique, abruptly notched near its end, and with the basal portion obliquely produced downwards and backwards, forming an inferior lobe. The dorsal fins are two in number; the first is always in advance of the ventrals, and often close behind the pectorals. A well developed anal fin is opposite the second dorsal, and always separated by a considerable interval from the caudal. The pectoral fins are of moderate size, and their external angles more or less produced and pointed; the ventrals moderately developed and inserted near the middle of the body. All of the fins are more or less angular. The last of the branchial apertures are above the pectoral fin. The head is of moderate size, depressed and oblong oval above, with a produced snout, and a mouth whose cleft is frequently longer than wide. The teeth are compressed, with the edges sharp and either smooth or finely denticulated. Such is the *representative* shark. The whole organization is adapted for rapidity of motion, for strength, and for the easy seizure of prey. These are the sharks that infest every sea and are the dread of the mariner; these are the ones with which the name of "*shark*" is pre-eminently associated by the English; to which the French have given that of "*Requin*," in commemoration of the many victims whose dying shrieks serve as their *requiem* or dirge of last repose; these the ones on which the Greeks have conferred the fear-summoning name of *Λάμια*.

Nearly related by form and habits is the well known "white shark," which attains a larger size and is still more feared than even the blue shark; with the attributes, it shares some of the names of the blue sharks; its form is, perhaps, even more adapted for rapidity of action, and its voracity is proportionally great; its vertebral column is much more bent upwards than in the former, and is nearly at right angles to the body. It may, therefore, be considered in such respects as the *type* of the order. Its branchial apertures are also somewhat larger than those of the blue sharks, and all are placed in front of the pectoral fins.

The family of the Galeorhinoidæ, or blue sharks, is by far the most numerous and important of the order, and alone contains nearly one-third the genera and more than half of the known species of living sharks. Its representatives are distributed in every sea and every zone.

The family to which the "white shark" belongs is, on the other hand, very poor in numbers, there being only five genera, a single one of which is represented by more than one well ascertained species, and the white shark is itself the only member of its group.

The most aberrant of the sharks and the most representative of, or nearly allied to, the Rays, are unquestionably the Rhinoidæ. This is evident from the condition of the caudal fin and the posterior portion of the vertebral column, the absence of the anal fin, the posterior position of the dorsal fins, and especially the development of the pectoral and the production forward of their bases, but the branchial apertures are truly lateral, and situated on the sides in the clefts of the pectoral fins; the body and head are also depressed as much as in some of the Rays, and the eyes are situated on the dorsal aspect of the latter. On account of the peculiarities of structure of these fishes, it has been recently proposed to isolate them as a sub-order.

Having thus, it is hoped, discovered the typical and the most aberrant groups of the order, it will be endeavored to approximately arrange the other families. At the head of the order, or rather as its first family, the Rhinodontoidæ are placed in order to establish a serial arrangement of the first families as much in accordance with their affinities as possible. A serial arrangement, however, rarely or never expresses the true affinities of families when they are diversified or complicated. Perhaps the following view in which the Alopecoidæ are taken as the central family, might more truly exhibit at least some of their relations.

Alopecoidæ,

Cestraciontoidæ.

Galeorhinoidæ.

Odontaspidoidæ.
(Ginglymostomatoidæ)
Lamnoidæ.
Rhinodontoidæ.

The remaining groups can scarcely be said to form a regular serial order. The following are regarded as peculiar or aberrant families.

Heterodontoidæ,
Notidanoidæ.

The other families diverge in two regular series and in different directions, but both tend towards the Rays: the Scylliorhinoids and their allies advancing towards the Rhinoidæ, and the Spinacoids and related families towards the Pristoid rays by means of *Pristiophorus*. It may not be unnecessary to remind some, that notwithstanding the relations thus alluded to, the respective orders of Sharks and Rays are perfectly well defined.

The series referred to are the following.

Spinacoidæ.
Scymnoidæ.
Echinorhinoidæ.
Pristiophoroidæ.

Ginglymostomatoidæ.
Scylliorhinoidæ.
Crossorhinoidæ.
Rhinoidæ.

The affinity of the Crossorhinoidæ to the Rhinoidæ is manifested by the depressed body and head, the terminal mouth, and the posterior position of the dorsal fins of those fishes, as well as by the fringed periphery of the head. The relations of the family to the Scylliorhinoidæ, and of the latter to the Ginglymostomatoidæ, are sufficiently evident, and need only be referred to.

Most of the families of sharks are almost cosmopolitan in their distribution, and representatives have been found wherever the seas have been sufficiently explored. Some are, nevertheless, quite limited and represented by few members; four have no more than a single species each.

The unique species of the Rhinodontoidæ has only been found at the Cape of Good Hope.

The living Heterodontoids are confined to the Pacific Ocean. Four species are now known: the anciently known Port Jackson shark (*Heterodontus Philippi* Blainville) of the Australian seas; the nearly allied *Heterodontus zebra* (Gray) of the seas of China and Japan; the *H. francisci* (Gill), recently discovered in the California waters; and the *H. pantherinus* (Gray) of the Gallapagos Islands.

The Pristiophoroids and Crossorhinoids are also represented by single species, both found in the Chinese and Japanese seas, and the Crossorhinus extends beyond into the Australian.

The only certainly known representative of the family of Alopecoidæ is widely distributed, ranging along the Atlantic and Mediterranean coasts of Europe, at the Cape of Good Hope, and crossing the Atlantic Ocean extends at least along a portion of the eastern coast of North America down to the Caribbean Sea.

§ III.

SYSTEMATIC ARRANGEMENT.

Two analytical tables or synopses of the families of the suborder of Squali are given. The first apparently represents the more natural arrangement and the more probable affinities of the families; its primary groups are characterized by the position of the anterior dorsal fin in the first place, and the presence or absence of an anal in the next. In the second, the families are first grouped with regard to the presence or absence of the anal fin, and subdivided in order to show the relations of the groups different from these of the previous synopsis.

FIRST SYNOPSIS.

I. Pectoral fins with the anterior margin rising directly from the base. SQUALI.

A. First dorsal entirely in advance of the pectorals; rarely obsolete.

B. Anal fin present.

C. Dorsal fins two.

a. Caudal lunate, very abruptly bent upwards; *tail keeled on each side.*

Branchial aperture behind above pectoral. Rhinodontoidæ.

Branchial apertures entirely before pectorals. Lamnoidæ.

aa. Caudal moderately bent upwards, notched near end, and with basal lobe small or rudimentary; tail not keeled.

D. Dorsals unarmed. Head normally depressed.

E. Branchial apertures entirely before pectorals. Odontaspidoidæ.

EE. Branchial aperture behind above pectoral.

a. Caudal exceedingly long. Eyes without nictitating membranes. Alopecoidæ.

aa. Caudal moderately elongated. Eyes with nictitating membranes.

Head laterally produced. Cestraciontoidæ.

Head normally formed. Galeorhinoidæ.

DD. Dorsals respectively armed in front with a spine. Head high. Heterodontoidæ.

CC. Dorsal fin single; first obsolete. Notidanoidæ.

BB. Anal fin absent.

a. Snout normally formed.

Dorsals respectively spinigerous at front. Spinacoidæ.

Dorsals unarmed. Scymnoidæ.

b. Snout prolonged like a saw. Pristiophoroidæ.

AA. First dorsal above or behind the ventrals.

B. Anal fin absent. Echinorhinoidæ.

BB. Anal fin present.

a. Caudal bent upwards; with basal lobe. Ginglymostomatoidæ.

b. Caudal not bent.

Mouth not terminal; body subcylindrical. Scylliorhinoidæ.

Mouth terminal; body depressed. Crossorhinoidæ.

II. Pectoral fins expanded at base in front and separated by a fissure from the neck. Rhinæ.

Mouth terminal. Rhinoidæ.

SECOND SYNOPSIS.

I. Pectoral fins moderately developed, not notched in front at the base. Squali.

A. Anal fin present.

B. Dorsal fins two; the first in front of the ventrals.

C. Branchial apertures entirely before pectoral fins.

a. Caudal moderately bent, unequal; tail not keeled. Odontaspidoidæ.

b. Caudal nearly lunate, much bent upwards; tail keeled on each side. Lamnoidæ.

CC. Branchial aperture behind above pectoral fin.

D. Tail keeled on each side; caudal lunate. Rhinodontoidæ.

DD. Tail not keeled. Caudal unequal, notched near end.

E. Dorsal fins unarmed.

Caudal extremely long; no nictitating membrane. Alopecoidæ.

Caudal moderately elongated; eyes with nictitating membrane.

Head laterally produced. Cestraciontoidæ.

Head normal. Galeorhinoidæ.

EE. Dorsals each spinigerous in front. Heterodontoidæ.

BB. Dorsal fins two; first above or behind ventrals.

C. Mouth inferior; body subcylindrical.
D. Caudal bent upwards, with basal lobe. Ginglymostomatoidæ.
DD. Caudal straight. Scylliorhinoidæ.
CC. Mouth subterminal; body depressed. Crossorhinoidæ.
BBB. Dorsal fin single; first absent. Notidanoidæ.
AA. Anal fin absent.
B. First dorsal before ventrals.
a. Dorsals, each armed in front with a spine. Spinacoidæ.
b. Dorsals unarmed.
Snout normally produced. Scymnoidæ.
Snout saw-shaped. Pristiophoroidæ.
BB. First dorsal above ventrals. Echinorhinoidæ.
II. Pectoral fins produced forward at base and correspondingly notched. Rhinæ.
Mouth subterminal, body depressed. Rhinoidæ.

Suborder SQUALI Gill, 1861.

Family RHINODONTOIDÆ, *Owen*.

Genus Rhineodon (*Smith*) *Müller and Henle*, 1838.

Rhinodon *Müller and Henle*.

Type Rhineodon typicus *A. Smith*.

Family LAMNOIDÆ *Müller and Henle*.

Synopsis.

Branchial apertures very large, nearly meeting under the throat. Teeth small. Cetorhininæ.
Snout abruptly slender and conic. Polyprosopus.
Snout short and blunt. Cetorhinus.
Branchial apertures moderate. Teeth well developed. Isurinæ.
Teeth compressed, triangular and serrated. Carcharodon.
Teeth nail-shaped, long, flexuous, prismatic, and acute.
Dorsal nearly intermediate between pectoral and ventrals. Isuropsis.

Dorsal close behind pectorals. **Isurus.**

Teeth compressed, triangular, entire, with one or two short pointed denticles on each side of the older ones. **Lamna.**

Subfamily CETORHININÆ *Gill.*

Genus Cetorhinus *Blainville*, 1816.

Tetroras *Rafinesque* 1810 (description and name improper).
Selache *Cuvier*, 1817.
Type Squalus maximus *Linn.*

Genus Polyprosopus *Couch*, 1861.*
Type Polyprosopus Rashleighanus *Couch.*

Subfamily LAMNINÆ *Gill.*

Genus Carcharodon *A. Smith.*
Type Squalus carcharias *Linn.*

Genus Isuropsis *Gill.*
Type Oxyrhina glaucus *Müll. and Henle.*

Genus Isurus *Rafinesque*, 1810.

Oxyrhina *Agassiz.*
Type Isurus oxyrhynchus *Raf.*

Genus Lamna *Cuvier*, 1817.

Lamia *Risso.*
Isurus *Gray*, 1815.
Type Lamna cornubica *Cuvier.*

Family ODONTASPIDOIDÆ (*Müll. and Henle*) *Gill.*

Genus Odontaspis *Agassiz.*

Carcharias *Rafinesque* 1810 (misconception).
Triglochis *Müller and Henle*, 1838.
Type Carcharias taurus *Raf.*

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* This genus seems to be valid, but is not yet well established. The absence of caudal carinæ or spiracles is quite improbable.

Family GALEORHINOIDÆ *Gill.*

Synopsis.

I. Teeth more or less compressed and with entire or serrated sharp edges. GALORHINIINÆ.

A. Spiracles obsolete.

B. Teeth with no lateral denticles. *Cynocephali.*[*]

C. Teeth with the points directed towards the sides, so that the smooth internal margins are nearly horizontal and present an incisive edge.

D. Teeth thick, with the points slender. Physodon.

DD. Teeth much compressed. Scoliodon.

CC. Teeth with the points, if at all, only moderately directed towards the sides, compressed.

D. First dorsal scarcely entirely behind the pectorals.

E. Teeth above with the base serrated on the outer or both sides. Teeth below entire. Hypoprionodon.

EE. Teeth more or less serrated in the lower as well as upper jaw.

Teeth well serrated, above broad and straight in front; below in front straight and claviform. Snout broad and short. Eulamia.

Teeth scarcely serrated, constricted at the base, claviform and straight in both jaws. Snout slender, conic. Isogomphodon.

DD. First dorsal intermediate between pectorals and ventrals.

E. Teeth serrated in both jaws.

Teeth straight in both jaws; above more or less constricted near the base and claviform. Snout short, conic. Lamiopsis.

Teeth curved outwards and often flexuous; outer margin with its upper and under

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[*] The synopsis of the genera of this group is to be consulted with much caution. At another time a more perfect one will be given and the genera more rigorously restricted.

halves meeting at a more or less blunt angle. Snout semioval. Isoplagiodon.
EE. Teeth entire below; above with the base coarsely serrated. Hypoprion.
EEE. Teeth entire in both jaws. Apriondon.
DDD. First dorsal near the ventrals. Cynocephalus.
BB. Teeth with one or two acute lateral denticles on each side. *Triænodontes.*
Nasal valves without barbels; tail pits developed. Triænodon.
Nasal valves with well developed barbels; tail pits none. Leptocharias.
AA. Spiracles developed.
B. Teeth with lateral denticles. *Scylliodontes.*
Snout blunt. Eye-openings long. Triakis.
BB. Teeth without lateral denticles. *Galeorhini.*
C. Caudal furrows obsolete. Galeorhinus.
CC. Caudal furrows above and below.
D. Teeth denticulated on both edges. Under caudal border with two notches.
Snout high, declining obliquely backwards. Tail forming about one-quarter of length. Boreogaleus.
Snout produced and depressed. Tail forming one-third of length. Galeocerdo.
DD. Teeth triangular, without a ledge, serrated. Caudal fin only once notched. Thalassorhinus.
DDD. Teeth without serrature internally.
Pupil convex above, pointed below.
Rictus little convex. Teeth above with the inner edge curved outwards; outer concave and serrated. Hemigaleus.
Rictus as long as wide. Teeth above with the inner margin incurved; outer with a denticulated ledge. Chænogaleus.
Pupil subcircular. Teeth not serrated. Loxodon.
II. Teeth flat and paved. MUSTELINÆ.
Eye-openings long. Mustelus.

Sub-family GALEORHININÆ *Gill.*

Group CYNOCEPHALI *Gill.*

Genus PHYSODON *Müller and Henle.*

Type Physodon Mülleri (*Val.*) *M. & H.*

Genus SCOLIODON *Müller and Henle.*

Type Scoliodon laticaudus *Müller and Henle.*

Genus HYPOPRIONODON *Gill.*

Type Carcharias hemiodon (*Val.*) *M. & H.*

Genus EULAMIA *Gill.*

Type Eulamia lamia *Gill.*

*Genus PLATYPODON *Gill.*

Type Carcharias menisorrah *Müller and Henle.*

Genus ISOGOMPHODON *Gill.*

Type Carcharias oxyrhynchus *Müller & Henle.*

Genus LAMIOPSIS *Gill.*

Type Carcharias Temminckii *Müller and Henle.*

Genus ISOPLAGIODON *Gill.*

Type Carcharias sorrah (*Val.*) *M. & H.*

Genus HYPOPRION *Müller and Henle.*

Type Carcharias (Hypoprion) Macloti *Müll. and Henle.*

Genus APRIONODON *Gill.* Feb. 1861.

Aprion *Müller and Henle*, 1838 (not Aprion *Cuv.*)

Type Aprionodon punctatus *Gill.*

Genus CYNOCEPHALUS *Klein.*

Carcharinus *Blainville*, 1816.
Carcharias *Cuvier*, 1817.
Prionodon *Müll. & Hen.*, 1838 (not Prionodon *Horsfield* 1823).

Type Squalus glaucus *Linn.*

Group TRIÆNODONTES (*Müll. and Henle*).

Genus TRIÆNODON *Müller and Henle.*

Type Triænodon obesus *Müller and Henle.*

Genus Leptocharias *A. Smith.*

Type Leptocharias Smithii *A. Smith.*

Group GALEI (*Müller and Henle*).

Genus Galeorhinus *Blainville.*

Galeorhinus *Blainville*, 1816.

Galeus *Cuvier*, 1817.

Type Galeorhinus galeus *Blainville.*

Genus Galeocerdo *Müller and Henle*, 1838.

Type Galeocerdo tigrinus *Müller and Henle.*

Genus Boreogaleus *Gill.*

Type Boreogaleus arcticus *Gill.*

Genus Loxodon *Müller and Henle*, 1838.

Type Loxodon macrorhinus *Müller and Henle.*

Genus Thalassorhinus *Müller and Henle*, 1838.

Type Thalassorhinus Rondoletii *Müller and Henle.*

Genus Hemigaleus *Bleeker.*

Type Hemigaleus microstoma *Bleeker.*

Genus Chænogaleus *Gill.*

Type Chænogaleus macrostoma *Gill.*

Group SCYLLIODONTES (*Müller and Henle*).

Genus Triakis *Müller and Henle*, 1838.

Type Triakis scyllium *Müller and Henle.*

Sub-family MUSTELINÆ *Bon.*

Genus Mustelus *Cuvier.*

Type Mustelus lævis *Bon.*

Family CESTRACIONTOIDÆ *Gill.*

Zygænidæ *Owen*, *Richardson*.

Zygænoidæ *Bleeker.*

Synopsis.

Nostrils in front near the middle, and with grooves extending *towards the eyes.* Head hammer-shaped, much produced laterally.	Eusphyra.
Nostrils near the eyes.	
Nostrils simple, with the frontal grooves rudimentary or obsolete. Head reniform.	Reniceps.
Nostrils with grooves extending in front towards *the middle.* Head hammer-shaped.	Cestracion.

Genus RENICEPS *Gill.*

Type Reniceps tiburo *Gill.*

Genus CESTRACION *Klein.*

Sphyrna *Raf.*, 1810.
Sphyrnias *Raf.*, 1815.
Cestrorhinus *Blainville*, 1816.
Zygæna *Cuvier*, 1817.
Platysqualus *Swainson*, 1839 (P. tiburo *Sw.*=Zygaena tudes *Val.*)
Sphyra *Vanderhoeven.*

Type Cestracion zygæna *Gill.*

Genus EUSPHYRA *Gill.*

Type Eusphyra Blochii *Gill.*

Family ALOPECOIDÆ, *Owen.*

Genus ALOPIAS *Raf.*, 1810.

Alopecias *Müller and Henle*, 1838.

Type Alopias vulpes *Bon.*

Family HETERODONTOIDÆ *Gill.*

Genus HETERODONTUS *Blainville*, 1816.

Cestracion *Cuvier*, 1817.

Type Heterodontes Philippii *Blainville.*

Family NOTIDANOIDÆ.

Synopsis.

Branchial apertures 6. — Hexanchus.
Branchial apertures 7. — Heptranchias.

Genus HEXANCHUS *Raf.*, 1810.

Monopterhinus *Blainville*, 1816.
Notidanus *Cuvier*, 1817.
Type Hexanchus griseus *Raf.*

Genus HEPTRANCHIAS *Raf.*, 1810.

Heptanchus *Müll. and Henle*, 1838.
Notorhynchus *Ayres*, 1855 (N. maculatus *Ayres*).
Type Heptranchias cinereus *Raf.*

Family SPINACOIDÆ *Owen.*

Synopsis.

A. Teeth of lower jaw subquadrate, with a nearly horizontal incisorial edge, and a point directed outwards.
  B. Teeth of upper and lower jaws similar. Scales cordiform. — Squalus.
  BB. Teeth of jaws dissimilar.
    C. Branchial apertures equidistant.
      Teeth of upper jaw with a large conical median cusp and two smaller ones on each side. — Spinax.
      Teeth of upper jaw slender, conic, and little incisorial.
    CC. Branchial apertures behind (4 and 5) approximated. Scales cordiform. — Oxynotus.
      Teeth of upper jaw triangular, on a quadrangular base. — Centrophorus.
AA. Teeth of lower as well as upper jaw straight, pointed, and with one or two smaller cusps on each side. Scales pointed, with a stellate base. — Centroscyllium.

Genus SQUALUS (*Artedi*) *Raf.*

Squalus *Raf.*, 1810 (*S. uyatus*).
Dalatias *Raf.*, 1810.
Acanthorhinus *Blainville*, 1816.
Spinax *Cuv.*, 1817.
Acanthias *Risso.*
Acanthias *Bon.*, 1838.
Type Squalus acanthias *Linn.*

Genus SPINAX *Bon.*

Etmopterus *Raf.*, 1810 (misconception).
Spinax sp. *Cuvier* (S. acanthias).
Spinax *Bonaparte*, 1838.
Acanthidium *Lowe*, 1839.
Type Spinax niger *Cloquet.*

Genus OXYNOTUS *Raf.*, 1810.

Centrina *Cuvier*, 1816.
Type Oxynotus centrina *Raf.*

Genus CENTROPHORUS *Müller and Henle*, 1838.

Lepidorhinus *Bonaparte*, 1838.
Acanthorhinus *Gray and Gebhard*, 1851.
Type Centrophorus granulosus *Müll. and Henle.*

Genus CENTROSCYLLIUM *Müller and Henle.*

Type Centroscyllium Fabricii *Müller and Henle.*

Family SCYMNOIDÆ, *Owen.*

Synopsis.

Teeth above broad; below lancet-shaped.	Scymnus.
Teeth above narrow; below quadrate, with a horizontal edge ending in a point directed outwards.	Somniosus.

Genus SCYMNUS *Cuv.*, 1817.

Dalatias *Raf.*, 1810 (misconception).
Scymnorhinus *Bon.*
Type Scymnus lichia (*Cuv.*) *Bon.*

Genus Somniosus *Lesueur*, 1818.

Læmargus *Müller and Henle*, 1838.

Leiodon *Wood*, 1846.

Type Somniosus brevipinna *Les.*

Family ECHINORHINOIDÆ *Gill.*

Genus Echinorhinus *Blainville*, 1816.

Goniodus *Agassiz.*

Type Echinorhinus spinosus *Blainville.*

Family PRISTOPHOROIDÆ *Bleeker.*

Genus Pristiophorus *Müller and Henle*, 1838.

Pristidophorus *Bon*, 1838.

Type Pristiophorus cirratus *Müller and Henle.*

Family GINGLYMOSTOMATOIDÆ *Gill.*

Genus Ginglymostoma *Müller and Henle*, 1838.

Nebrius *Ruppell.*

Type Ginglymostoma concolor.

Family SCYLLIORHINOIDÆ *Gill.*

Synopsis.

Caudal fin moderately elongated.
  Branchial apertures nearly equidistant.
    Spiracles close behind eyes. Anal fin under or before the second dorsal. — Scylliorhininæ.
      Upper margin of tail serrated by larger scales. — Pristiurus.
      Upper margin of tail unarmed.
        Nasal valves confluent, with their hinder border entire and free. — Scylliorhinus.

Nasal valves separated by an isthmus or wide septum.	
Head normally formed and oblong.	
Nasal valves simple, without cirrhi or grooves.	Halælurus.
Nasal valves with cirrhi or grooves.	Catulus.*
Head transversely oval and swollen behind.	Cephaloscyllium.
Spiracles chiefly beneath the eye.	
Anal fin in advance of second dorsal.	PARASCYLLIINÆ. Parascyllium.
Anal fin behind second dorsal and contiguous to the caudal.	HEMISCYLLIINÆ. Hemiscyllium.
Fourth and fifth branchial apertures close together.	CHILOSCYLLIINÆ.
Back not carinated.	Chiloscyllium.
Back carinated.	Synchismus.
Caudal fin very long.	STEGOSTOMATINÆ. Stegostoma.

Sub-family SCYLLIORHININÆ *Gill.*

Genus PRISTIURUS *Bonoparte*, 1838.

Galeus *Rafinesque*, 1810.

Type Pristiurus melanostomus *Bon.*

Genus SCYLLIORHINUS *Blainville*, 1816.

Scyllium *Cuvier*, 1817.

Type Scylliorhinus canicula *Blainv.*

Genus HALÆLURUS *Gill.*

Type Halælurus burgeri *Gill.*

Genus CATULUS *Smith.*

Poroderma *Smith* (P. Africanum *Smith*).

Type Catulus stellaris *Smith.*

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* The genus *Catulus* is not a homogenous one, but it is preferred provisionally to retain it with the limits here assigned.

Genus CEPHALOSCYLLIUM *Gill.*

Type Scyllium laticeps *A. Duméril.*

Sub-family PARASCYLLIINÆ *Gill.*

Genus PARASCYLLIUM *Gill.*

Type Hemiscyllium variolatum *A. Duméril.*

Sub-family HEMISCYLLIINÆ *Gill.*

Genus HEMISCYLLIUM *Müll. and Henle.*

Type Hemiscyllium ocellatum *Müll. and Henle.*

Sub-family CHILOSCYLLIINÆ *Gill.*

Genus CHILOSCYLLIUM *Müll. and Henle*, 1838.

Type Chiloscyllium plagiosum *Müll. and Henle.*

Genus SYNCHISMUS *Gill.*

Type Chiloscyllium tuberculatum *Müll. and Henle.*

Sub-family STEGOSTOMATINÆ *Gill.*

Genus STEGOSTOMA *Müll. and Henle*, 1838.

Type Stegostoma fasciatum *Müll. and Henle.*

Family CROSSORHINOIDÆ *Gill.*

Genus CROSSORHINUS *Müll. and Henle.*

Type Crossorhinus barbatus *Müll. and Henle.*

Suborder RHINÆ Gill, 1861.

Family RHINOIDÆ *Gill.*

Genus RHINA *Klein*, 1742.*

Squatina *Dumeril*, 1806.

Type Rhina squatina *Raf.*

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* The pre-occupation by Klein of the name of *Rhina* necessitates a change of the appellation of the genus of the same name among the Rays; that of *Rhamphobatis* may be substituted.

XXXIII.—*Squalorum Generum Novorum Descriptiones Diagnosticæ.*

Theodore Gill, Auctore.

Read 16th December, 1861.

Familia LAMNOIDÆ.

Sub-familia LAMNINÆ *Gill.*

Genus Isuropsis *Gill.*

Lamninæ rostro acuto conicoque et dentibus ut in genere *Isuro* sed pinnâ dorsali primâ fere medio pinnas pectorales inter et ventrales sitâ.

Isuropsis glaucus.
  Oxyrhina glauca *Müller and Henle.*
Isuropsis Dekayi.
  Lamna punctata *Dekay.*

Familia GALEORHINOIDÆ.

Sub-familia GALEORHININÆ.

Genus Hypoprionodon *Gill.*

Cynocephali rostro semiovali, rotundato; dentibus maxillarum ambobarum latis cuspidibus glabris; maxillæ superioris paulo obliquis, basis latere externo serratis vel dentatis. Pinna dorsali prima pectoralibus magis quam ventralibus approximata, fere antice supra pectorales sita.

Hypoprionodon hemiodon.
  Carcharias (Hypoprion) hemiodon (*Val.*) *M. and H.*

Genus Eulamia *Gill.*

Cynocephali rostro brevi vel vix oblongo et semiovali, fere subconico: dentibus maxillæ utræque marginibus denticulatis, maxillæ superioris antice sat latis, margine interna convexis, vel obliquiter linearibus, margine externo plus minusve angulariter excavata; maxillæ inferioris basi latis, cuspidibus fere rectis et plus minusve angustis; pinna dorsalis prima pinnis pectoralibus magis quam ventralibus approximata, sæpe antice fere pectoralium bases supra cita.

Eulamia Milberti.
Carcharias (Prionodon) Milberti (*Val.*) *M. and H.*

Genus Isogomphodon *Gill.*

Cynocephali rostro elongato et conico: dentibus paulo vel vix denticulatis, utraque maxilla fere rectis claviformibus et basi plus minusve constrictis. Pinna dorsali anteriore vix tota pone pinnas pectorales sita.

Isogomphodon oxyrhynchus.
Carcharias (Prionodon) oxyrhynchus *M. and H.*

Genus Lamiopsis *Gill.*

Cynocephali rostro breviter conico; dentibus maxillæ utræque rectis; maxillæ superioris denticulatis, ad basin plus minusve constrictis. Pinna dorsali prima fere medio pinnas pectorales inter et ventrales sita.

Lamiopsis Temminckii.
Carcharias (Prionodon) Temminckii *Müller and Henle.*
Lamiopsis limbatus.
Carcharias (Prionodon) limbatus *Müller and Henle.*

Genus Isoplagiodon *Gill.*

Cynocephali rostro oblongo, semi-ovali: dentibus maxillæ utræque denticulatis, sat latis, compressis, extrorsum vel sursum spectantibus margine interna obliquiter incurvatis basi externa processu serrato. Pinna dorsali pinnis pectoralibus, paulo magis quam ventralibus approximata.

Isoplagiodus sorrah.
Carcharias (Prionodon) sorrah *Müller and Henle.*

Genus Aprionodon *Gill.*

Cynocephali rostro plus minusve producto et conico: dentibus maxillæ utræque margine glabris, compressis basi latis cuspidibus rectibus vel vix extrorsum spectantibus. Pinna dorsali fere medio pinnas pectorales inter et ventrales sita.

Aprionodon brevipinna.
  Carcharias (Aprion) brevipinna *Müller and Henle.*
Aprionodon isodon.
  Carcharias (Aprion) isodon *Müller and Henle.*

Genus Chænogaleus *Gill.*

Galei rostro conico; ore rictu sat vel fere oblongo, longo ac lato: dentibus maxillæ superioris margine interna concavis vel curvatis, basi externa processu denticulato vel dentato; maxillæ inferioris gracilibus, non denticulatis, plus minusve extrorsum spectantibus; oculorum pupillis triangularibus; pinna dorsali prima fere medio pectorales inter et ventrales sita; pinna caudali mediocriter elongata, margine inferiori unico lobo posteriori.

Chænogaleus macrostoma *Gill.*
  Hemigaleus macrostoma *Bleeker.*

Genus Boreogaleus *Gill.*

Galei rostro brevissimo, valde obliquiter ad rictum declinente; rictu semicirculari: dentibus maxillæ utræque compressis, extrorsum spectantibus, margine interna curvatis vel convexis, externo basi extrorsum productis: oculorum pupillis ovatis, superne convexis, inferne subacutis; pinna dorsali prima pinnis pectoralibus multo magis quam ventralibus approximata; pinna caudali mediocriter elongata (circiter ¼ corporis longitudinis formante), lobo posteriori unico; colore haud variegato.

Borcogalus arcticus.
  Galeus arcticus *Faber.*

Familia CESTRACIONTOIDÆ.

Genus Reniceps *Gill.*

Caput reniforme vel late cordiforme: nares valde oculis approximati; sulci rostro-nasales obsoleti.

Reniceps tiburo.
Squalus tiburo *Linn.*

Genus Eusphyra *Gill.*

Caput valde latum et transversum, mallei instar formatum; nares rictu multo magis quam oculis approximatæ, sulcis conspicuis fere usque ad oculos extendentibus.

Eusphyra Blochii.
Zygæna Blochii *Val.*

Familia SCYLLIORHINOIDÆ

Sub-Familia SCYLLORHININÆ.

Genus Halælurus *Gill.*

Scylliorhininæ capite oblongo; valvulis nasalibus nec cirratis nec sulcatis, isthmo separatis; pinnâ dorsali secunda plus minusve pone analem sitâ.

Halælurus burgeri.
Scyllium burgeri *Müller and Henle.*

Genus Cephaloscyllium *Gill.*

Scylliorhininæ capite late ovali, temporibus tumido; valvulis nasalibus sulcatis, non ori extendentibus, isthmo lato separatis; pinna dorsali posteriore plerusque anali opposita.

Cephaloscyllium laticeps.
Scyllium laticeps *A. Duméril.*

Sub-familia PARASCYLLIANÆ *Gill*

Genus Parascyllium *Gill.*

Scylliorhinoidæ capite, ore, labiis, et valvulis nasalibus fere ut in *Hemiscyllio;* corpore graciliore, subcylindrico; pinna dorsali prima capite remota, sat pone pinnas ventrales sita; dorsali secunda caudali propiore; pinna anali plerumque ante dorsalem secundam sita, sat caudali remota.

Parascyllium variolatum.
Hemiscyllium variolatum *A. Duméril.*

Sub-familia CHILOSCYLLIINÆ *Gill.*

Genus Synchismus *Gill.*

Chiloscylliinæ dorso ante pinnam dorsalem anteriorem non carinato.

Synchismus tuberculatum.
Chiloscyllium tuberculatum *Müller and Henle.*

NOTE.

The preceding diagnoses of the new genera of Squali, indicated in the systematic article on the order, are as brief as they could possibly be made consistently with clearness and accuracy. The species described by all preceding naturalists had been at first referred to the new genera, but it has been since deemed more proper to await the publication by Dr. Bleeker of the plates illustrative of his species and the renewed examination of others before finally arranging them. A few species cannot well be referred to any of the established genera, but I have not considered it expedient to propose new ones for them at present. In the monographical synopses of the different families which I hope to be able to submit to naturalists on some future occasion, the families, sub-families, and genera will be fully described and compared, and the extinct, as well as the recent forms, noticed. The former need a very careful revision by one having knowledge of the subject, some writers, subsequent to Agassiz, having been little acquainted with recent forms and not knowing the value to be attached to dentition.

XXXVI.—*On the Extension of the Carboniferous System of the United States, so as to include all true Coals.*

BY R. P. STEVENS.

Read December 16, 1861.

IT will be recollected, that the late Prof. Eaton, and other early geologists of our country, considered the Onondaga limestone, including the Cherty beds, commonly called the pyritiferous limestone of Eaton, to be equivalent to the Mountain limestone of the English authorities; and as there was at that time a very prevalent contagion among American geologists to trace equivalents of American strata with European, all above this horizon of limestone would naturally fall into the carboniferous system.

As the geological investigations of New York and Pennsylvania progressed, it was found that this horizon of rock strata was low down, nearly at the base of the Devonian, and that the whole thickness of the Catskill Mountains (Hamilton, Portage, and Chemung groups), did actually lie between this limestone and the coal of Pennsylvania; and that this vast thickness of sedimentary rocks was greatly increased, travelling south-westwards from these mountains, until in south-western Virginia they had attained their maximum development.

By the united labors of the brothers Rogers, and their very able assistants, certain vast deposits of conglomerates were placed at the base of the Carboniferous, called by them "Formation No. XII."—or the Coal Conglomerate, in contradistinction from other conglomerates lying both above and below this very certain horizon.

This stratum was well defined in the anthracite region of the Schuylkill river, the semi-bituminous region of the Broadtop mountains, and Blossburgh; also in the bituminous coal regions west of the Alleghany mountains. This conglomerate was considered to be equivalent, if not identical, with the Coal Conglomerate of the English coal measures.

As the geological examinations of our country were extended, and when the more methodical and scientific measures were adopted of connecting every line of examination with a regular system of levelling, added to palæontological investigations, it was found that some of the coal basins of the States of Michigan, Iowa, Missouri, and Northern Illinois, had not this Conglomerate developed, or at least that it could not be identified; but in some instances, as at La Salle, on the Illinois river, the Conglomerate was a rock belonging to a far earlier age.

The brothers Rogers, in their investigations in Virginia, found in Wythe, Pulaski, and Montgomery counties two or three thousand feet of green and red shales, containing *three* or more workable strata of coal, lying below their basal "formation No. XII." Mr. Lesley made a similar discovery in Blair county, Pennsylvania, at the head of the Juniatta river, where he found six hundred feet of shales, below the "No. XII.," containing *three* workable seams of coal. The late Dr. Owen made similar discoveries in the States of Kentucky and Arkansas. In Northern Illinois and Iowa, in the black shales of the horizon of the Portage Group of the New York system, workable seams of coal have been found. This shale contains land plants, and is highly charged with bitumen, and is the source of the petroleum and gas springs of New York, Canada, Northern Pennsylvania, and Ohio. When we add to these numerous instances, amounting almost to a law, that Prof. Dawson found a similar system of coal measures, below the Formation No. XII., in his geological exploration of Nova Scotia, are we not carried back towards the opinions of the Fathers of American Geology?

Why should a certain coarse conglomerate, grading off into a sandstone, seldom to be distinguished from any other conglomerate and sandstone lying either above or below it, by any palæontological—the only true evidence, and never by any lithological evidence, be considered the basal measure of the carboniferous? Far below lie true coal-bearing strata. Long ages previous to its being laid down, the continent was clothed in verdure by the Nœggerathia, Lepidodendron, Sigillaria, and numerous families of ferns, always considered reliable coal plants. Carboniferous reptiles walked the sandy shores, and insects floated on the evening air. Other palæontological evidence, drawn from the marine fauna, tends in the same direction to which the previous statements of this paper lead us, viz.; to carry the base of the carboniferous system *three thousand feet* nearer the foundations which the fathers erected. It includes all the workable seams of coal. The more safely may we travel in this direction when we take into the elements of our reasoning that in all the vast thickness of rock strata, which we should add to the carboniferous, there is no unconformity, but a regular sequence in the order of deposition, over a large portion of the American continent, untouched by any disturbing causes.

While we dig deeper for the carboniferous foundations, may we not carry the structure higher, and find the roof-tree hidden near the *Triassic?* In pursuing the geological investigations of Missouri, Maj. Hawn crossed over into Kansas and brought back rich trophies as the result of his geological foray beyond the borders. Upon investigation these trophies were found to be fossils of the Permian type. About the same time Mr. Meek made the same discovery. Prof. Swallow soon followed with confirming evidence from observations from the west of Missouri. Prof. Hall has also identified fossils as belonging to the Permian. Dr. Shumard made similar discoveries in the Guadelupe Mountains, Texas.

The coal-bearing rocks west of the Mississippi are divided into upper and lower. Above the upper lie the coal measures of Kansas, one thousand feet thick, having within them many seams of coal. Above these, and still higher, lie about eight hundred feet of limestones, shales, clays, cherty layers, and sandstones. All these depositions lie conformable to each other. The fossils gradually grade into each other, from the lower into the upper carboniferous, and from the latter into the lower Permian, and thence into the upper Permian. About 27 per cent. of the carboniferous pass into the Permian.[*]

During all the period of the deposition of the rocks under consideration, one law of life, with its succession of species, seems to have prevailed ; while at the same time there was one law of geological deposition. There is no abrupt change, all is orderly and easy in its sequence. Faunas familiar to us, through all the carboniferous seas, follow us into the Permian, and there we lose them for ever.

The same floras from peat bogs, oozy marshes, or sandy ridges, are seen in every roof stratum of shale or sandstone. There is no sign of change either in stratification, conformity, or palæontology. Why should one be called Carboniferous, another Subcarboniferous, and still another, Permian ?

In this connexion another coal-bearing stratum comes into view, which there is more difficulty to place in the newly enlarged boundaries of the carboniferous. I allude to the coal of North Carolina and Richmond, Virginia. According to H. D. Rogers, the coal of Virginia belongs to the Jurassic series. With him agrees Sir Charles Lyell. William B. Rogers thinks that this coal is of the age of the Triassic. Dr. Emmons, whose facilities for examining the beds of North Carolina were diligently improved, classes the Deep and Dan river beds with the Permian. Prof. Heer, a very competent authority, sustains him in this opinion. The great want of conformability of the red sandstone of the Atlantic slope, with the coal of the Apalachian systems, makes this part of our inquiry one of very great difficulty.

Prof. Emmons' argument for the Permian relationship of these coal strata is derived,

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[*] Since writing the above my notice has been called to a paper of Mr. Thomas Davidson, of England, upon the occurrence in the Permian of carboniferous fossils, and he cites the following, *Martinia clannyana, Spiriferina crista, Camarophoria schlotheimi, C. globulina, Lingula credneri.* To this catalogue of mollusca, Mr. J. W. Kirby adds the following crustacea, *Cythere elongata, C. ornata, Bairdia gracilis, Gyrocanthus formosus.*

1st, from the reptilian remains.

2d, from the fish remains.

3d, from the vegetable remains, and,

4th, from an unconformability of the lower or coal-bearing strata of the red sandstone system, and the upper and non-productive.

If Prof. Emmons' views are adopted, there is a beauty and harmony in the geological history of America not otherwise discovered. With equal steps, and in grand procession, the geological phenomena proceed with the palæontological, from the first appearance of a land plant to the complete metamorphism of the hydro-carbon of plants into bituminous, semi-bituminous, and anthracite coal. While the brown coal, or lignite, would belong to another age, having its own peculiar geological and biological phenomena, allied to each other and distinct from the preceding age.

The carboniferous, then, will begin with the dawn of insular and continental vegetation, and terminate with the true coals—including "the false coal measures," "the sub-carboniferous," "the barren measures," "the upper and lower coal measures," "the Permian coals," "the Jurassic coals," or whatever name or synonym may be used, excluding lignite or impure coal. A system giving us nearly six thousand feet of sedimentary strata, deposited under similar conditions, over an area of the American continent extending from Nova Scotia to Texas, and from North Carolina to the Rocky Mountains, if not the Sierra Nevada—obeying one comprehensive law of chemical action, and exhibiting one magnificent era of floral verdure with coeval land and marine faunas.

GENERA OF PLANTS IN THE ENLARGED CARBONIFEROUS.

Permian.—Anabracaulis, Calamites, Chondrites, Dictyocaulis, Equisetum, Filias, Gymnocaulus, Lycopodites, Sphenopteris, Walchia.

Carboniferous.—Aleopteris, Allamodendron, Alethopteris, Annularia, Artisia, Asterophyllites, Aspidaria, Asplenites, Cardiocarpon, Carpolites, Casea, Calamites, Cordaites, Cyclopteris, Callipteris, Coniopteris, Cannophyllites, Cyatheites, Crematopteris, Cyperites, Dictyopteris, Equisetum, Flabellaria, Halonia, Hemitelites, Hippurites, Hymenophyllites, Knorria, Lepidodendron, Lepidophlois, Lepidophyllum, Lycopodites, Nephropteris, Neuropteris, Nœggerathia, Odontopteris, Pecopteris, Pinnularia, Pycnophyllum, Polysporia, Pachyphyllum, Poacites, Rhabdocarpus, Rhizolithes, Sagenaria, Sigillaria, Sphenophyllum, Stigmaria, Staphilopteris, Stigmatocanna, Syringodendron, Sphenopteris, Schizopteris, Ulodendron, Whittleseya.

FORMATION NO. XII. MILLSTONE GRIT COAL CONGLOMERATE.

Marine Fauna.—Cephalopoda, Gasteropoda, Conchifera.

PRE-CARBONIFERA, PROTO-CARBONIFERA, SUB-CARBONIFERA, PSEUDO-CARBONIFERA.

Genera of Plants.—Aleopteris, Annularia, Apoxylon, Asterites, Asterophyllites, Bornia ?, Calamites, Cardiocarpon, Carpolites, Cordaites, Cyclopteris, Dadoxylon, Diplotegeium, Dictyopteris, Dymophyllum, Filicites, Fucoides, Halonia, Hymenophyllites, Lepidodendron, Lepidophlois, Lepidophyllum, Lepidostrobus, Lycopodites, Megaphytum ?, Neuropteris, Nœggerathia, Odontopteris, Pecopteris, Pinnaria, Plumalina, Protaxites, Psilophyton, Rhabdocarpus, Rhizolites, Sagenaria ?, Selaginites, Sigillaria, Sphenococcites, Sphenopteris, Sphenophyllum, Sphenophyllites, Staphyllopteris, Sternbergia, Stigmaria, Stigmatocauna ?

XXXVII.—*Remarks on Certain Species of North American* HELICIDÆ.

BY THOMAS BLAND.

(*Continued from p.* 142, *and concluded.*)

Read December 16th, 1861.

Helix Downieana nov. sp.

Plate IV. fig. 23–24.

T. subobtecte umbilicatâ, subglobosâ, tenui, subpellucidâ, obsolete costulato-striatâ, lineis spiralibus impressis sublente confertim decussatâ, virenti-corneâ; spirâ brevi, obtusâ; anfr. 5, convexis, ultimo tumido, antice gibbosulo, vix descendente, constricto; aperturâ obliquâ, lunato-ovali; perist. albo, labiato, reflexo, margine dextro expanso, columellari angulatim dilatato umbilicum fere tegente.

Shell umbilicate, umbilicus nearly covered, subglobose, thin, subpellucid, with obsolete rib-like striæ, decussated with crowded microscopic spiral lines, greenish horn-colored; spire short, obtuse; whorls five, convex, the last tumid, anteriorly somewhat gibbous, scarcely descending, constricted; aperture oblique, lunate-oval; perist. white, labiate, reflected, right margin expanded, columellar margin angularly dilated, nearly covering the umbilicus.

Diam. maj. 10½, min 9½, Alt. 6 mill.

Station.—Among leaves, at the roots of grass and shrubs in rocky places.

Habitat.—University Place, Franklin Co., Tenn. Downie!

Remarks.—In the autumn of 1860 I received three specimens, through Bishop Elliott, from Major Downie of Brunswick, Ga., to whom I dedicate the species. In form and aspect it is most like *H. Christyi* Nob., but has no parietal tooth; it is allied also to *H. clausa* Say, and *H. Mitchelliana* Lea.

Helix alternata Say.

The geographical distribution of the varieties of *H. alternata* is interesting. The species attains its largest size in Ohio and Michigan—from the former I have it with 6 whorls, Diam. maj. 24, min. 22, Alt. 10 mill. In both of those States individuals are found of nearly uniform color, from pale straw to dark reddish brown. In Canada, on Goat Island, Niagara, and on Cunningham Island, Lake Erie, the shell is frequently much elevated, even globose, thickened, and almost covered with dark-colored flammules.

A beautiful variety was discovered a few years ago by Mr. Ferguson on the Helderberg Mountains, New York; subsequently near Greenwood Cemetery, Long Island; and also in the woods adjoining the New York Bay Cemetery, near Jersey City. It is small, comparatively smooth, especially at the base, has a shining somewhat translucent epidermis, which on dead shells becomes opaque. The suture is well impressed and the outer whorl is not, as usual in the species, obsoletely carinated. The deep red flammules are disposed with much regularity on a pale horn-colored ground. An average sized specimen, with 5 whorls, is Diam. maj. 15½, min. 14, Alt. 6½ mill. The animal does not exude the saffron-colored mucous secretion usually observed in the typical form. I designate this shell as *H. alternata* Say *var. H. Fergusoni.*

In Tennessee, North and South Carolina, and Georgia, the moderately elevated and numerous striæ of *H. alternata* are replaced by sharply defined distant ribs. In a specimen from North Carolina, for which I am indebted to Mr. David Christy, these ribs have a remarkable development, being nearly 1 mill. apart on the last whorl; the shell is depressed, but obsoletely carinated only. Bishop Elliott found a few specimens on the eastern slope of the Cumberland Mountains, strongly ribbed, depressed, and the last whorl subcarinate, the carina in a measure obsolete behind the aperture, but modifying its form.

The var. found fossil at Jackson, Miss., is well marked, being ribbed above, the ribs passing over the periphery, with, at the base, an additional less prominent rib between each. I have living examples of the same form from Tennessee, Arkansas, and Louisiana.

Helix mordax Shuttleworth.

This was described by Shuttleworth in the following terms: (*Bern. Mitth.*, 1852, *Diag. n. Moll.*, No. 2.)

T. late et perspective umbilicata, depressa, sublenticularis, carinata, tenuis, luteo-cornea, strigis rufis interruptis fasciatim ornata, costis validis flexuosis remotis utrinque eximie asperata; anfr. 5½, plani; apertura perobliqua angulatim lunari-ovalis; perist. simplex, acutum.

Diam. maj. 18, min. 16, Alt. 6 mill.

Hab.—In mont. Carolinæ sept. specimina ultra 12 legit Rugel.

Obs.—H. alternatæ valde affinis, sed costis validioribus, ad 1 mill. inter se remotis, distincta. H. Cumberlandiana Lea (forsan mere forma monstruosa), quâcum carina congruit, differt (ex icone) testa tantum tenuiter striata nec costata.

Shuttleworth observes that *H. mordax* being costate is distinct from *H. alternata*, and also from *H. Cumberlandiana*, described by Lea as *tenuiter striata;* the fact is, that both his own and Lea's species are costate, although the costæ in the latter are not so sharp and regular, indeed on the last whorl near the aperture are partially obsolete. Shuttleworth states that his shell agrees, as regards the carina, with *H. Cumberlandiana.* I have not seen an authentic specimen of *H. mordax*, but looking at the description consider that it bears the same relation to *H. Cumberlandiana*, as *H. Carolinensis* to *H. obstricta*, and although with costæ like the southern forms of *H. alternata* already noticed, being carinated to the extent described, it is a variety of *H. Cumberlandiana.*

Helix Cumberlandiana Lea.

I subjoin a copy of Lea's description, (*Trans. Amer. Phil. Soc.*, VIII. *p.* 229, *pl.* 6, *fig.* 61, 1840.)

CARACOLLA CUMBERLANDIANA.

T. lenticulata, carinata, striata, albida, fusco-notata, latè umbilicata, ad carinam superne et inferne impressa; anfr. quinis; apertura angulata, intus sulcata; labro acuto.

Shell lenticular, carinate, striate, whitish, brown-spotted, widely umbilicate, impressed above and below the carina; whorls 5; aperture angular, within furrowed, lip acute.

Hab.—Cumberland Mts. near Jasper, Tennessee. Dr. Currey.

Diam. .54, length .14 inch.

Remarks.—Among many species of land shells which I owe to Dr. Currey's kindness, were two individuals of this Caracolla which does not appear to have been before noticed. It has some resemblance to *H. alternata* Say, but may at once be distinguished by its depressed, flat, lenticular form and carina. It is a very interesting species, and has a remarkable furrow above and below the carina; all the whorls are visible in the umbilicus, and are striate all over.

This beautiful species was extremely rare, even in American cabinets, until Bishop Elliott, after diligent search during several summers, discovered it in August, 1860, inhabiting a single spur of the Cumberland Mountains, near University Place, Franklin County, Tenn. In one of his letters to me he mentions having found it on the ground, under stones and wood, in company with *H. spinosa* Lea, and also after rain creeping upon precipitous faces of rock, with a few *H. alternata* (the common Southern form), and *Helicina orbiculata* Say. My largest specimen measures, Diam. maj. 17, min. 15, Alt. 5½ mill.

Helix tridentata Say.

This well known species varies much in size; for a very unusually large specimen, said to be from Tennessee, I am indebted to Mr. Henry Van Nostrand; it measures,

Diam. maj. 23, min. 19, Alt. 9 mill. (6 whorls).

The comparatively smooth Ohio form is,

Diam. maj. 19, min. 16, Alt. 7 mill. (5½ whorls).

A small variety from Goat Island, N. Y., is,

Diam. maj. 13, min. 10½, Alt. 5½ mill (5 whorls).

A variety found by Mr. H. Van Nostrand, at Delaware Water Gap, Pa., has very rigid somewhat distant ribs.

The position of the upper lip-tooth in this species is not absolutely constant, its distance from the lower one is variable.

Helix triodontoides nov. sp.

Plate IV. fig. 11–12.

T. perforatâ, globoso-depressâ, tenui, subpellucidâ, pallide corneâ, superne subobsolete costulato-striatâ, basi convexâ, lævigatâ; spirâ brevi; anfr. 5 convexiusculis, ultimo prope aperturam plicato, antice deflexo; aperturâ rotundato-lunari, obliquâ, coarctatâ; perist. reflexo, calloso, marginibus dente linguiformi, acuto, triangulari junctis, dextro dente in margine calli posito, basali dente obliquo munito, ambobus dentibus parvis, inter se remotis.

Shell perforate, globose-depressed, thin, subpellucid, pale horn-colored, with partially obsolete rib-like striæ above; base convex, smooth; spire short; whorls 5, somewhat convex, the last plicately ribbed near the aperture, deflexed anteriorly; aperture roundly lunate, oblique, contracted; perist. reflected, callous, the margins joined by a sharp linguiform triangular tooth, the right with a tooth on the margin of the callus, basal with an oblique tooth, both teeth small and far apart.

Diam. maj. 9½, min. 8, Alt. 5 mill.

Habitat.—De Witt Co., Texas, Dr. Newcomb!; Corpus Christi, Texas.

Remarks.—It has been generally assumed that the *H. trio-*

donta Jan is identical with *H. Texasiana* Moricand. Férussac (Bul. Zool., 1853) states that it is so. Dr. Binney, looking at specimens bearing Jan's name in the Paris Museum, made the following note: "*H. triodonta* Jan is the shell which we have from Texas like *H. tridentata*, with very small teeth; it seems to run into *H. Texasiana* Mor." Dr. Binney referred to the shell which I have above described; if Jan's shell is the same, it should bear the name given by him. W. G. Binney sent specimens to Pfeiffer, whose opinion is quoted (Terr. Moll. iv. 79, pl. 78, fig. 18), that it is var. of *H. Texasiana*, but Mr. Binney now concurs with me in considering it distinct.

H. triodontoides is a more delicate shell than *H. Texasiana*, and does not attain the same size. It is not as distinctly ribbed, is somewhat more elevated, and the aperture is more round. The last whorl is less devious at its termination beneath, the lip teeth are smaller and wide apart. In *H. Texasiana* they are close together, and the space between them has much resemblance to the notch in *H. hirsuta.* In that respect, as well as in the form of the aperture, Moricand's shell is more closely allied to *H. Mooreana* W. G. By.

H. Texasiana varies much in size, which is not the case with my species. The following are measurements of specimens of the former in my cabinet:

Diam maj. 11½, min. 9, Alt. 5 mill.
" " 8 " 7 " 4 "

Helix inflecta Say.

Say gives $\frac{9}{20}$ths of an inch as the greatest transverse diameter of this species; the size and other characters are, however, variable. For an extraordinarily large specimen, found at University Place, Tenn., I am indebted to Bishop Elliott; having 5½ whorls, it measures, Diam. maj. 16, min. 14, Alt. 7 mill.

A small var., Diam maj. 9, min. 8, Alt. 4½ mill., inhabits Taylor Co., Ga. (Dr. Neisler), in which the superior tooth on the peristome is situated lower than in the typical form; and in consequence the space between it and the inferior tooth is reduced.

From Darien, Ga. (Dr. Wilson !), and St. Simon's Island, Ga. (J. Postell !), I have a variety in which the epidermis has very little of the usual hirsute character; the aperture is more rounded, and the two lip teeth are small, in fact mere denticles. The parietal tooth is less oblique and more central, not being continued to the lower margin of the little reflected lip.

Helix Rugeli Shuttleworth.

The following is a copy of Shuttleworth's description of this species (*Diag. n. Moll.*, *No.* 2, *p.* 18).

T. obtecte perforata, orbiculato-convexa, granulato-striata, parce setosa, corneo-cerea; spira brevis, obtusa; anfr. 5½, convexiusculi, ultimus antice subito deflexus, ad aperturam valde constrictus; apertura depressa, dente valido linguiformi flexuoso in pariete apertarali intrante coarctata; perist. reflexum, intus callosum, margine dextro dente magno obtuso profunde immerso extus subscrobiculato, basali dente minore transverso submarginali instructo.

Diam. maj. 13, min. 11½, Alt. 6¼ mill.

Hab.—In Tennessee (Rugel).

Obs.—Specimina plurima vidi. Variat magnitudine, sed semper major quam H. inflecta Say, cui maxime affinis; differt insuper dente parietali magis evoluto et angulatim flexuoso, et dente supero marginis dextri peristomatis crasso et valde immerso.

As regards the form and position of the upper tooth on the lip, this species has the same connexion with *H. inflecta*, as *H. fallax* with *H. tridentata.*

Shuttleworth's measurements show that his species is not always larger than *H. inflecta.* The following are the dimensions of the largest and smallest specimens in my cabinet.

Diam. maj. 13½, min. 11½, Alt. 6 mill. Cherokee Co. N. Car.
Christy !

" " 9 " 7 " 4½ "

Helix hirsuta Say.

This species varies in size; in my cabinet are specimens which measure as follows:

Diam. maj. 11½, min. 10, Alt. 6½ mill.
" " 6 " 5 " 4 "

The last whorl in front of the aperture, especially in the larger forms, is more or less angulated, but I have never seen a specimen carinated. The position of the parietal tooth is often rather oblique, but usually nearly parallel with the lower lip, and is more or less distant from it. The nature of the epidermis varies; in some forms the hairs are very numerous, in others comparatively few. Spiral impressed lines sometimes occur beneath the epidermis, at the base of the shell.

Helix stenotrema Férussac.

Terr. Moll. pl. XLII., fig. 4.

W. G. Binney (Terr. Moll. IV., p. 61) treats this as distinct from *H. hirsuta*, "its characteristics being constant in post-pleiocene fossil as well as in recent individuals." He does not, however, define the characters, and I confess that it is difficult to do so satisfactorily. In *H. stenotrema* the notch is invariably small, and more central than in *H. hirsuta;* the parietal tooth is more produced over the aperture, and its lower edge is a regular curve, not somewhat sinuous as in the latter and *H. spinosa* Lea; it is also curved downwards at its outer extremity, not terminating abruptly, as usual in those species. The form of the parietal tooth, however, varies in *H. hirsuta*, from which Férussac's species can chiefly, if indeed not alone, be distinguished by the size and position of the notch.

H. stenotrema is not found in the Eastern and Middle States. It does not vary much in size, seldom exceeding,

Diam. maj. 10, min. 9, Alt. 6, mill. Tennessee, Shuttleworth!

Helix spinosa Lea.

This well known species varies in size. Large specimens from Alabama and the Cumberland Mountains, Tenn., are much depressed above and little convex beneath; they measure, Diam. maj. 14, min. 13, Alt. 5 mill.

A small var. from the Look Out Mountains, Tenn. (2000 ft., Bp. Elliott!), is proportionately more elevated above, and more convex at the base, measuring, Diam. maj. 12, min. 11, Alt. 5 mill.

Helix Edgariana Lea.

Plate IV. fig. 18. (Twice nat. size.)

This was described by Lea in the following terms:

CARACOLLA EDGARIANA.

T. supra subplanâ, subtus convexâ, rufo-fuscâ, enormiter striatâ, imperforatâ; spirâ brevi; suturis vix impressis; anfr. 5 planulatis, aperturâ angustissimâ; columellâ dentem unicum longum et laminatum habente; labro incrassato, in medio inciso.

Shell nearly flat above, beneath convex, reddish-brown, irregularly striate, imperforate; spire short; sutures scarcely impressed; whorls 5, flattened; aperture very narrow; columella furnished with a long lamellar tooth; lip thickened, in the middle notched.

Hab.—Cumberland Mountains, Tennessee. Diam. .40, length .20 inch.

Remarks.—Among a number of Helices taken by Mr. Edgar were three specimens of this species, which do not seem to have been before observed. The carina is sharp. The form of the aperture is that of *H. hirsuta* Say, except that the superior and thick part of the lip joins the tooth of the columella; on the surface of the shell there is no hirsute character. Several specimens of the *hirsuta* accompanied them, all of which presented their usual globose character. It differs from *C. spinosa* Nob., in being smaller, less flattened, and being without the cilia. (*Proc. Am. Phil. Soc.*, II. 31. *Trans. Am. Phil. Soc.* IX., p. 2.)

To. Dr. Binney's remarks on *H. spinosa* Lea (Terr. Moll. II., 155), Dr. Gould adds the following:

"There is a small variety of this species, having about half the usual diameter, and having its faces much more convex, which Mr. Lea has described under the name of *Caracolla Edgariana.* Mr. Lea says, its aperture has the form of *H. hirsuta*, except that the superior and thick part of the lip joins the tooth of the columella. We are not yet prepared to admit this as a distinct species, though farther researches may prove it to be so. The junction of the lip with the columellar tooth seems to have been accidental in Mr. Lea's specimens; at least, we have several specimens, corresponding to his in other respects, where this character is wanting. Moreover, there is a large carinated variety of *H. hirsuta*, from the same locality, which, so far as the aperture is concerned, corresponds still better with Mr. Lea's description. His other character, by which he distinguishes *H. Edgariana* from *H. spinosa*, its being without cilia, is not constant, for fresh specimens of both large and small are well garnished with hairs, quite as abundantly as in *H. hirsuta;* and the difference in the two species is that in the latter the hairs are erect, while in *H. spinosa* they are prostrate. Unfortunately the engravings were made from specimens destitute of hairs."

There are two specimens in my cabinet which accord entirely with Lea's description, and also with fig. 2, Pl. XLIV. Terr. Moll., the habitat of one unknown, the other collected by Bishop Elliott in Tennessee. I have seen no specimen, agreeing otherwise with the type, in which the junction of the lip with the parietal tooth is wanting, and believe it to be a good specific character.

H. Edgariana differs also from *H. spinosa* in the following particulars: it is smaller, more elevated, and more convex beneath. In form the parietal tooth is most like that of *H. stenotrema*, while that of *H. spinosa* is more nearly allied to that usually prevailing in *H. hirsuta.* The whorls of *H. spinosa* are flattened and exserted, the carinated edges of all being seen, but in *H. Edgariana* the upper whorls are rather convex, and defined by a well marked suture. Traces of hairs rarely exist at the base of *H. spinosa*, and no scars indicating their presence are visible on dead or denuded shells, whereas in *H.*

Edgariana there are distant short prostrate hairs, with strongly marked scars on the shell. Fresh or young specimens have no doubt the cilia, as in *H. spinosa.*

The specimen had from Bishop Elliott measures,

Diam. maj. 9, min. 8, Alt. 5 mill.

Helix labrosa nov. sp.

Plate IV., fig. 19, (twice nat. size.)

T. imperforatâ, lenticulari, carinatâ, carinâ pone aperturam subobsoletâ, solidâ, arcuatim striatâ, sub epidermide fusco-corneâ; epidermide tenui, supra setis prostratis munitâ; spirâ convexo-conoideâ, obtusulâ; anf. 5½ planiusculis, ultimo antice deflexo, constricto, basi subinflato, lineis numerosis spiralibus impressis sub epidermide ornato; aperturâ perobliquâ, anguste auriformi, dente valido in toto pariete aperturali linguæformi arcuatim intrante coarctatâ; perist. calloso, reflexiusculo, marginibus callo sinuato junctis, margine basali incrassato, introrsum perdilatato, medio valde inciso.

Shell imperforate, lenticular, carinated, the carina somewhat obsolete behind the aperture, solid, with curved striæ, dark-brown colored beneath the epidermis, thin epidermis with prostrate hairs; spire convex-conoid, obtuse; whorls 5½, rather convex, the last deflexed, constricted, the base inflated, and sculptured beneath the epidermis with numerous impressed spiral lines; the aperture very oblique, narrowly ear-shaped, contracted by a strong linguiform tooth extending along the entire parietal wall; peristome callous, somewhat reflected, the margin joined by a sinuous callus, the basal margin thickened, inwardly much dilated, with a deep and wide notch in the middle.

Diam. maj. 12½, min. 10, Alt. 6½ mill.

Habitat.—Waschita Springs, Arkansas (Cabinet of W. G. Binney); Hot Springs, Arkansas (Cab. Smithsonian Institution); Alabama (W. G. Binney); Tennessee (Bishop Elliott!).

Remarks.—This species has been confounded with *H. Edgariana* Lea, from which, however, it differs in several well marked characters. The specimens to which Mr. W. G. Binney refers (Terr. Moll. IV., p. 65), as being of Lea's species, are of that now under consideration.

The thickened and reflected peristome, and deep wide notch, sufficiently distinguish *H. labrosa* from *H. Edgariana.* The notch in the latter, situated in the centre of the aperture as in *H. stenotrema*, is in a measure obsolete, but in *H. labrosa* it is strongly developed, and nearer to the outer edge of the peristome as in *H. hirsuta.* The form of the parietal tooth of my species is like that of *H. hirsuta*, while *H. Edgariana* is in that particular more like *H. stenotrema.*

H. Edgariana, in fact, connects *H. stenotrema* with *H. spinosa*, but *H. labrosa* is rather allied to *H. hirsuta*, and in the character of the peristome to *H. maxillata* Gould.

W. G. Binney has a pale, thin, apparently immature specimen of *H. labrosa*, entirely agreeing with it as above described, excepting that the lower lip is not thickened.

Helix monodon Rackett.

There appears to be no doubt that *H. fraterna* Say is a variety of this species; the degree to which the umbilicus is open is very variable, it is comparatively rarely entirely closed. The parietal tooth is sometimes much elevated, approaching in form to that of *H. hirsuta.* I have several specimens in which the lower lip is continued as in the typical form, so as partially to cover the umbilicus, but in a subsequent stage of growth has its columellar termination duplicated, recurved, and united to the parietal tooth. Occasionally there is a callus, having the appearance of an incipient tooth, on the inner margin of the outer lip.

The following are measurements of specimens in my cabinet.

H. monodon Rack., umbilicus open.
Diam. maj. 11, min. 10, Alt. 5½ mill (6½ whorls); Texas.
“ “ 7 “ 6 “ 4 “ (5½ “), N. Car.

H. fraterna Say, umbilicus entirely closed.
Diam. maj. 10, min. 9, Alt. 5 mill (5¾ whorls), Goat Isl., N.Y.
“ “ 7½ “ 6½ “ 4 “ (5½ “), Alabama.

I have three specimens of *H. monodon*, sent to me by Mr. Sloate, formerly of San Francisco, who assured me, on the authority, however, of another person, that they were found near the mouth of the Columbia River, Oregon. I confess that I do not feel satisfied of the correctness of the statement.

H. Leaii Ward is the most striking variety, if not indeed entitled to specific rank; it inhabits by no means so wide an area as *H. monodon* or the var. *H. fraterna*, being found only, I believe, in Michigan, Iowa, Indiana, and Ohio. Mr. Frank Higgins, in his Catalogue of the Mollusca of Columbus, Ohio, insists on its being distinct. He says that it is found in the swamp prairies only, its station being very different to that of *H. monodon*, and that it never appears to extend its range, and does not vary in color of shell or animal.

Mr. A. O. Currier, of Grand Rapids, Michigan, in a late letter remarks, “*H. monodon* and *H. Leaii* have entirely different habits, the former is abundant in dry, the latter rare in moist situations and swamps associated with *Amnicola lapidaria* Say, and other semi-aquatic species. *H. Leaii* lives during half the year under water and ice, while *H. monodon* is found under the bark of trees and rotten stumps. If their stations were changed both would become extinct.”

The measurements of my largest and smallest specimens are,
Diam. maj. 8, min. 7, Alt. 4 mill. (5½ whorls), Ohio.
“ “ 7 “ 6 “ 3½ “ (5 “), “

Helix appressa Say.

This species is variable in several characters. In Georgia it attains its greatest size; from that State I have examples with six whorls, Diam. maj. 20, min. 18, Alt. 9½ mill. Some southern forms are beautifully sculptured with numerous spiral lines, and have a narrow but very projecting parietal tooth. Near Nashville, Tenn., a small flattened var. is found, widely ribbed above, the ribs obsolete at the base, the lip widely reflected, and the parietal tooth arcuate.

Say's "var. *a*, Labrum with two projecting angles," inhabits Illinois; in some specimens the aperture and teeth are singularly like those of *H. palliata.*

From Wilmington, N. Car., and City Point, Va., I have a remarkable variety,—depressed, with 4½ whorls, the ribs far apart, and the surface between them somewhat granulated; the periphery more sharply angulated than in other forms, and the parietal tooth more arcuate. Diam. maj. 14, min. 11, Alt. 5½ mill.

Specimens from Illinois have the whorls flattened above, and partially exserted, showing a tendency to variation in the same direction as *H. palliata.*

Helix palliata Say.

This shell has been fully identified, but doubts exist as to Say's var. *a.*, *H. obstricta* Say, *H. helicoides* Lea, and *H. Carolinensis* Lea. Having had much correspondence with conchologists, both here and in Europe, respecting those forms, I propose fully to examine the questions which have arisen concerning them.

In 1821 Say thus described *H. palliata* and *H. obstricta,* (*Jour. Acad. Nat. Sci., Phila.* II., *pp.* 152–154),—

H. PALLIATA.—Shell depressed, with elevated lines, forming grooves between them; epidermis fuscous, rugose with very numerous minute tuberculous acute prominences; volutions five, depressed above, beneath rounded, forming an obtuse angle exteriorly, which is more acute near the termination of the labrum; umbilicus covered with a white callus; aperture contracted by the labrum; labrum widely reflected, with two profound obtuse sinuses on the inner side above the middle, forming a prominent distinct tooth between them, and a projecting angle near the middle of the lip; labium with a large, prominent white tooth, placed perpendicularly to the whorl, and obliquely to the axis of the shell, and nearly attaining the umbilical callus.

Inhabits Illinois. Length of the column seven-twentieths of an inch. Greatest breadth, four-fifths of an inch.

Var. *a*.—A very prominent acute carina, destitute of minute prominences. Inhabits Ohio. Breadth nearly one inch.

H. OBSTRICTA.—Shell depressed, with elevated lines forming grooves between them; epidermis pale-brownish, naked; volutions five, depressed above, beneath rounded, with an acute, projecting carina; umbilicus covered with a white callus, indented; mouth resembling that of *H. palliata*.

Inhabits Ohio. Breadth nearly one inch.

This species is very closely allied to *H. palliata*, but the epidermis is not covered with small elevations as in that shell, and the carina is very prominent and remarkable.

In 1831 Lea described the following species:

H. CAROLINENSIS.—T. supradepressâ, infra inflatâ, oblique striatâ, fuscâ, imperforatâ; anfr. 5, spirâ maxime obtusâ; aperturâ coarctatâ; labro albo, reflexo, latoque, duobus dentibus instructo, quorum inferior longus et laminatus, superior parvus et conicus est, columellâ dentem elevatum incurvumque habente, columellæ basi valde impressâ. Diam. $\frac{14}{20}$ths. Length $\frac{7}{20}$ths inch.

Hab.—South Carolina, near Cheraw.

Shell depressed above, inflated below, obliquely striated, fuscous, imperforate; whorls 5; spire very obtuse; aperture contracted; outer lip white, broad, and reflected, furnished with two teeth, the inferior one long and lamellar, the superior one small and conical; columella with an elevated incurved tooth; base of the columella much impressed.

Remarks.—I found a few specimens of this fine Helix while travelling through South Carolina three years since. They were taken from beneath the bark of an old tree. It is closely allied to Mr. Say's *palliata*, but differs in the region of the base of the columella being more deeply impressed. The oblique striæ are more distinct, and no specimen which I obtained is in the least hirsute. (*Trans. Amer. Phil. Soc., N. S.* IV., *p.* 108, *Pl.* XV., *figs.* 33–a. b. c.)

Caracolla Helicoides.—T. orbiculatâ, fuscâ, supra plano-convexâ, subtus inflatâ, imperforatâ, oblique striatâ; anfr. 5, spirâ obtusissimâ; aperturâ contractâ; labro albo, lato et reflexo, dentibus duobus instructo, quorum inferior longus et laminatus, superior parvus et conicus est; columellâ dentem unicum, longum, elevatum et incurvum habente. Diam. $\frac{18}{20}$ths. Length $\frac{9}{20}$ths inch.

Hab.—Tennessee, near Nashville.

H. palliata? Say var. *a.* *Acad. Nat. Soc.* II., *p.* 152.

Shell orbicular, fuscous, plano-convex above, inflated below, imperforate, obliquely striated; whorls 5; spire very obtuse; aperture contracted; outer lip white, broad, and reflected, furnished with two teeth, the inferior one long and lamellar, the superior one small and conical; columella with a long, elevated, incurved tooth.

Remarks.—Among the fine shells brought by Prof. Vanuxem, some years since, from a tour through the Western States, were two specimens of this beautiful Caracolla. In its specific characters it resembles *H. palliata* Say, and *H. Carolinensis* described in this paper. It is destitute of the hirsute appearance of the *palliata*, and is entirely distinct in the flatness of the whorls of the spire. In the *Carolinensis* the base of the columella is more impressed, and the whorls more inflated. (*Trans. Amer. Phil. Soc. l. c., p.* 109, *Pl.* XV., *figs.* 34, *a*, *b*, *c.*)

On the cover of No. 6, of his American Conchology (1834), Say published the following note:

C. helicoides Lea, Trans. Am. Phil. Soc., IV. N. S., is var. *a.* of *H. palliata* Say, *H. denotata* Fer.

H. Carolinensis Ibid. corresponds by description and figures with *H. appressa* Say, var. *a.*

Dr. Binney, in the Boston Journal (1840), and also in the Terr. Moll. (1851), places *H. obstricta* and Lea's two species in the synonymy of *H. palliata.* W. G. Binney (Terr. Moll. IV., 1859) observes that the extreme variation of *H. palliata* has given rise to considerable confusion. He designates *H. Carolinensis* as "a prominent variety," but holds *H. obstricta* to be distinct, having no doubt of its identity with *H. helicoides;* he adds to the synonymy of *H. obstricta* Say's var. *a.* of *H. palliata*, considering that the descriptions agree. The name *H. denotata* appears in Férussac's Prodromus. In the Histoire, Pl. 50, fig. 7, agrees with Lea's figure of *H. helicoides*, but in the Explication des Planches it is erroneously called *H. appressa* Say. In the Bull. Zool. (1835), Férussac refers *H. Carolinensis* to *H. palliata*, and treats *H. helicoides* as a variety of it. Pfeiffer (Mon. Hel. Viv.) has *H. Carolinensis* in the synonymy of *H. palliata*, and *H. helicoides* in that of *H. obstricta.*

I have now quoted everything of any moment which has been written on the subject of the different forms of, or immediately allied to *H. palliata.*

There can be no doubt as to the *H. palliata* Say. It is impossible, however, with absolute certainty to identify Say's var. *a.* and his *H. obstricta*, looking at the descriptions, and his note of 1834 on *H. helicoides.* Say gives Ohio as the habitat of the two first, which increases the difficulty, inasmuch as no carinated form, so far as I know, occurs in that State.

Say, in 1824, separated *H. obstricta* from var. *a.* ; in 1834 he pronounced *H. helicoides* to be the latter, and did not mention the former. At the latter date he erroneously referred *H. Carolinensis* to *H. appressa*, and I believe that he was equally in error in referring *H. helicoides* to var. *a.* instead of to *H. obstricta.*

Judging alone from Say's diagnosis of *H. obstricta*, I should certainly consider it identical with *H. helicoides* as *figured* by Lea, who, in his description, makes no allusion to the carina. Say characterizes the carina of *H. obstricta* as *acute*, *projecting*, *very prominent*, *and remarkable.* In *H. helicoides* the carina is certainly remarkable; projecting from the edges of all save the apicial whorls, compressed, and overlapping the suture, as in *H. Cumberlandiana* Lea, a shell unknown to Say. Under these circumstances I concur with W. G. Binney in placing *H. helicoides* in the synonymy of *H. obstricta.*

H. palliata, var. *a.*, is described by Say as having a very prominent acute carina, and destitute of minute prominences.

The only shell to which the description applies (excluding *H. obstricta*) is *H. Carolinensis* or an intermediate form, and I am decidedly of opinion that Lea's species has been misunderstood by authors; that it is in fact a variety of *H. obstricta*, to which it is nearly allied in epidermis and sculpturing, rather than of *H. palliata*, from which, in those particulars, it essentially differs.

The nature of the epidermis and sculpturing are the only constant specific characters which distinguish *H. palliata* from *H. obstricta.* In the former, the epidermis has "numerous minute tuberculous acute prominences;" the striæ are close together, and somewhat irregular in development. In the typical form the whorls are convex, with a well impressed suture; the last whorl is obtusely angulated in front of, but not behind the aperture.

The following are the dimensions of the largest and smallest specimens in my cabinet.

Diam. maj. 23, min. 20, Alt. 10 mill. (5 whorls).
" " 17 " 14 " 8 " (4½ ").

The species varies in the form of the whorls and extent of the angulation of the periphery, as follows.

Var. β.—Whorls flattened above, slightly exserted, the last more sharply angulated in front of the aperture, with the striæ, especially behind the aperture, more distinctly defined.

Diam. maj. 22, min. 19½, Alt. 8½ mill. (5 whorls).

I am indebted to Mr. A. O. Currier of Grand Rapids, Mich., for beautiful specimens from Mumfordsville, Ky., and Pittsburg Landing, Tenn.

Var. γ.—Whorls planulate above, and so exserted as to show the carinated edges of all excepting the apicial whorls, the last whorl with an acute projecting carina continued to the back of the aperture; the umbilicus not always entirely covered by the reflected lip.

Diam. maj. 21½, min. 18½, Alt. 7 mill. (5 whorls).

Bishop Elliott collected fine specimens at Jasper Town, Tenn.

Helix obstricta Say.

SYNONYMY.

Helix *obstricta Say* Jour. Acad. Nat. Sci. Phila., II., 154, 1821.
——— *palliata Say var. a.* Jour. Acad., l. c., 152.
——— *Carolinensis Lea* Trans. Amer. Phil. Soc. N. S., IV., 108, pl. XV., figs. 33, a, b, c, 1831.
Caracolla *helicoides Lea* Trans Amer. Phil. Soc., l. c., 109, pl. XV., figs. 34, a, b, c.
Helix *palliata Binney* Terr. Moll. II., 136, var. pl. XV., 1851.
——— ——— *var. H. Carolinensis W. G. Binney.* Terr. Moll. IV., 57, 1859.

From the dates at which this species and its varieties were described, the most distinctly carinated form must be treated as the type, although the nature of the variations is the same as in *H. palliata.*

H. obstricta Say (*H. helicoides* Lea) differs from *H. palliata* in the following particulars; the epidermis is free from "tuberculous prominences," but has raised spiral lines between the costæ on the upper and lower surfaces of the shell. It has elevated, rigid, distant costæ, the whorls are subexserted and acutely carinated, the carina of the upper whorls compressed, and overlapping the sutures as in *H. Cumberlandiana* Lea. The umbilicus, as in the most carinated form of *H. palliata*, is not always entirely covered by the reflected lip.

The typical form varies in color from pale to dark brown, and also in size and elevation, as the following measurements will show:

Diam. maj. 25, min. 22, Alt. 10 mill. (5½ whorls). Cab. W. G. Binney, Lea!
" " 23 " 20 " 8½ " (5 whorls). Bersh. Spr., Tenn., Elliott! My Cab.
" " 20 " 17½ " 8 " (5 whorls). Indiana, Dr. Ingalls! My Cab.

Var. β. Whorls subexserted, carina less acute and prominent, partially obsolete behind the aperture, not covering the sutures.

Diam. maj. 24, min. 19, Alt. 8 mill. (5 whorls).
" " 20½ " 17 " 7 " (5 ").

Bp. Elliott collected many specimens at Columbus, Geo. This var connects *H. Carolinensis* Lea with *H. obstricta*, and is generally found in cabinets under the former name.

Var. γ. Whorls more convex, the last obtusely angulated in front of, but very little behind the aperture.

Diam. maj. 21, min. 17, Alt. 7½ mill. (5 whorls). South Carolina, Lea! Cab. Acad. Nat. Sci. Phila.

Diam maj. 18, min. 16, Alt. 7 mill. (5 whorls). My Cabinet.

This is the typical *H. Carolinensis* Lea, holding precisely the same relation to *H. obstricta*, as *H. palliata* to *H. palliata* var. γ.

Helix vultuosa Gould.

Pl. IV. fig. 21.

I have lately received from Mr. A. O. Currier, of Grand Rapids, Michigan, a very instructive specimen collected near Pine Town, Cherokee County, Texas, by Miss S. N. Bates.

It is larger than the usual form, and has the characteristics of the species singularly developed. The last whorl is so produced as to leave both the lip teeth far within the aperture; the exterior *scrobiculi* are long and deep, the space between them being almost as much elevated as in *H. auriculata* Say.

In specimens had from Dr. Gould, the edge of the peristome between the teeth is thickened, but in the example before me it is produced into an erect, white, polished lamella, 3 mill. long and 1½ mill. in height, as shown in my figure.

Dr. Gould remarks, that *H. vultuosa* differs from *H. Texasiana* Mor., " by having no line of callus connecting the pillar-tooth with the angle of the lip, thereby forming a re-entering angle." There is, however, a callus at the lower termination of the pillar-tooth, extending nearly 1 mill. in the direction of the upper angle of the lip, which is shown in the figure of the aperture, Terr. Moll. III., pl. XL. In Mr. Currier's specimen this callus extends for a short distance across the parietal wall, at a right angle with the tooth, and is thence continued upwards towards, but not so far as the upper angle of the lip.

I subjoin measurements—

Diam. maj. 10, min. 9, Alt. 5½ mill. Dr. Gould's specimen.
" " 12 " 10½ " 6 " A. O. Currier's "

It is curious to notice how much the increased development of the characters of *H. vultuosa* gives to that species affinities, not existing in the typical form, with the group to which *H. auriculata* belongs.

But I should remark that some of the North American Helices, especially the toothed species, are by intermediate varieties connected in a marked degree.

Note on the Toothed Helices of North America.

The frequent occurrence of toothed shells of the Genus Helix on the North American Continent is very remarkable.

In W. G. Binney's "Check List" of the species of "Eastern North America from the boreal regions to the Rio Grande," published by the Smithsonian Institution, 116 are enumerated, of which no less than 61 have one or more teeth in the aperture, or within the whorls. In his list of the species of the "Pacific Coast from the extreme north to Mazatlan," Binney mentions 31 species, of which four have teeth, while 8 have them out of 31 named, (exclusive of those embraced in the Pacific Coast list), in his list of Mexican Helices. Species similarly armed are numerous in the West Indies, and not unfrequent in Central and parts of South America.

What office in the economy of the living tenants of the shells these processes, showing much uniformity of design, are destined to perform, it is difficult, indeed impossible, in the present state of our knowledge, to comprehend. When the teeth, from their form and number, contract to a considerable degree the apertural space through which the animal can alone protrude itself, they appear capable of affording to it protection against the entry of its enemies, or a means of removing particles of earth or other foreign matter adhering to its mucous-covered body, when withdrawing into its habitation. I am not, however, aware of any differences in the habits of the animals of shells with and without teeth, which warrant such or any other theories as to their value. Shells with large and small, toothed and toothless apertures, are found inhabiting the same localities, and subject to the same external influences and circumstances.

The form and position, and with very trifling exceptions the number of the teeth, are constant and reliable specific characters. In proof of this, and as evidence of their value, I may mention that when the aperture of a toothed shell is accidentally broken, the animal not only repairs the injured part, but reproduces the teeth. I have specimens of *H. appressa*, *inflecta*, *monodon*, *septemvolva*, and *tridentata*, in which, after the formation of the parietal tooth, the aperture and part of the last whorl adjoining were broken off, and the animals not only reconstructed the reflected lips of their shells, but added also the parietal teeth, the old ones remaining as monuments of the destroyed apertures. In one of my specimens of *H. tridentata*, after completion of the shell, the animal continued the last whorl about 2 mill. beyond the lip, partially reflected the new lip, and added two incipient teeth in advance of the old ones. On Plate IV., fig. 20, a sketch is given of the very singular reparation of one of my specimens of *H. septemvolva*. The fracture was behind the aperture, which the animal in consequence abandoned, but it formed a new one by reflecting the outer lip, on the lower part of which it added a small tooth,—it found insufficient space for another parietal tooth behind the old aperture.

A number of the North American Helices have, besides the teeth, the process first noticed by Lea (Obs. V., 60), as a "pillar or additional column, placed like a fulcrum (buttress) in the interior, against the wall of the ordinary column, at the distance of a fifth to a third of a revolution of the whorl from the aperture." Lea first observed this in *H. spinosa*, and subsequently in seven other species. He remarks that the fulcrum "will be found in some species to be a simple round column soldered to the paries of the main column; in others a compressed or flattened column extending into the cavity of the whorl." The purpose, he adds, "of this fulcrum or buttress is very evidently instituted for the greater strength of the ultimate whorl, which, being very much enlarged, seems in some of these more delicate species to require additional support."

With regard to the particular use of this curious appendage, which exists only, so far as I know, in shells having the aperture contracted by teeth, I suggest that it acts literally as a *fulcrum*, in connexion with which the muscles of the animal have increased leverage power to draw back its protruded body into the shell, in the performance of which operation the teeth are obstacles,—yet many toothed shells are without this process.

In repaired individuals of *H. monodon*, not only is a new parietal tooth added, as above mentioned, but the *fulcrum* is also reconstructed in its proper position with respect to the new aperture. The locality of the old fulcrum is indicated by a callus,—whether it was broken off or removed by the animal I am unable to determine.

The following, framed from personal observation of specimens in my cabinet, presents an arrangement of the species of Helix of Eastern North America, based on the number of teeth, distinguishing those which have the fulcrum, and also the character of the lip—whether simple or reflected.

A. LIP SIMPLE—NO FULCRUM.

1. *One tooth within at base of aperture.*

H. perspectiva Say.

2. *Two teeth within at base of aperture.*
    H. suppressa Say.
    " gularis "
3. *Two internal lamellæ.*
    H. lasmodon Phill.
4. *Two or more internal teeth repeated in two or more series.*
    H. lineata Say.
    " interna "
    —
    " multidentata By.

B. LIP REFLECTED—NO FULCRUM.

5. *One parietal tooth.*[*]
    H. exoleta By.
    " thyroides Say.
    " bucculenta Gould.
    " Wheatleyi Bland.
    " dentifera By.
    " Roemeri Pfr.
    —
    " Christyi Bland—allied in form to H. inflecta Say.
6. *One tooth on lower lip.*[†]
    H. profunda Say.
    —
    " Pennsylvanica Green, tooth not prominently developed.
7. *One parietal tooth, and one on lower lip.*
    H. Sayii By.
8. *One parietal tooth, and one (lamelliform) on lower lip.*
    H. elevata Say—var. without lip tooth.
    " Clarkii Lea.
    " appressa Say—var. with outer lip tooth, like *H. palliata.*
9. *One parietal tooth, one (lamelliform) on lower lip and one on outer lip.*
    H. palliata Say.
    " obstricta "

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[*] *H. albolabris* not unfrequently, and *H. multilineata* rarely have this tooth.

[†] *H. albolabris, exoleta,* and *thyroides* have often a tooth-like callus on the lower lip near its columellar termination.

10. *One parietal and two lip teeth.*

H. inflecta Say.
“ Rugeli Shuttl.
—
“ tridentata Say.
“ Hopetonensis Shuttl.
“ fallax Say.

11. *One parietal lamella, continued from its lower end upwards to superior termination of lip, and two lip teeth.*

H. triodontoides Bland.
“ Hindsi Pfr. } upper lip tooth modification of the notch of
“ ventrosula Pfr. } *H. hirsuta.*
“ Texasiana Mor.—both lip teeth ditto.

12. *Modification of same form of parietal lamella, with no lip teeth.*

H. septemvolva Say.
—
“ cereolus Muhlf. } have also an internal lamina.
“ Carpenteriana Bland. }

13. *Modification of same form of parietal lamella, with two lip teeth, more or less lamelliform.*

H. oppilata Mor.
“ auriformis Bland, upper lip tooth with incipient hook.
“ avara Say. }
“ espiloca Rav. } upper lip tooth with hook; the lip
“ Postelliana Bland. } teeth especially in *H. auriformis* and
“ auriculata Say. } *H. avara* are modifications of the
“ uvulifera Shuttl. } notch of *H. hirsuta.*
—
“ Ariadne Pfr.

14. *Two parallel parietal laminæ, with internal teeth.*

H. labyrinthica Say.
—
H. Hubbardi Brown.*

C. WITH FULCRUM.

15. *One parietal lamelliform tooth, lower lip more or less laminated.*

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* The lip of *H. Hubbardi* is reflected. Brown in his description (Proc. Acad. N. Sci., Phila. 1861), by an oversight has the word “simplici” as well as “breviter reflexo.”

H. monodon Rack., lip reflected, var. with denticle on outer lip.
" barbigera Redf. "

—

H. Edvardsi Bland, small notch, lower lip more or less appressed.
" spinosa Lea, " " "

—

H. Edgariana Lea, " " "
" stenotrema Fer., " " "

—

H. hirsuta Say, deep notch, " "
" labrosa Bland, " lower lip produced.

—

H. maxillata Gould, no notch, lower lip produced and duplicated within the aperture.

D. LIP REFLECTED—WITH FULCRUM.

16. *Parietal process modification of* § 11, *and two lip teeth.*

H. leporina Gould—lip teeth modified form of notch.
" pustuloides Bland.
" pustula Fer.

—

H. Mooreana W G. By.
" tholus.* "

—

H. vultuosa Gould, continuation of parietal lamella to lip incipient only.

—

H. Dorfeuilliana Lea.
" Troostiana "
" fastigans L. W. Say.
" Hazardi Bland.

17. *One parietal and two lip teeth.*

H. introferens Bland,—allied to *H. fallax* and *H. vultuosa.*

18. *Parietal process modification of* § 11, *with lamella on lower lip and two extending downwards, forming, far within the aperture, a modified duplication of the lower lip, with notch having reflexed hook.*

H. hippocrepis Pfr.

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* *H. tholus* is, I believe, a large var. of *H. Mooreana.*

The four species having teeth, comprised in W. G. Binney's Pacific Coast List, are *H. germana* Gould, allied to *H. monodon* Rack., but without the fulcrum, belonging to the foregoing section 5; *H. devia* Gould, to section 8; *H. acutedentata* W. G. By., to 13, assuming from its affinity with *H. Ariadne* that it has no fulcrum, and *H. loricata* Gould, which has a well developed tubercle, belonging to section 17. To these may be added *H. Mullani* Bland and Cooper (sec. 9), and *H. polygyrella* Bld. and Coop., which, unlike any other North American species, has, with an unreflected lip, a parietal tooth and two series of three teeth in each within the last whorl.

Note on Variation in Species of Helix in Eastern North America.

It will be seen from the foregoing remarks that many of the species of Helix inhabiting Eastern North America are subject to considerable variation. Without entering upon the question of causes of variation, I should notice that, with the exception of size, the variability of shells is rather in ornamentation than in characters which indicate differences in the structure of the animals, or can affect their welfare.

The variations referred to are chiefly in size, color, sculpture, and degree of the angulation of the periphery.

Wollaston (On the Variation of Species, p. 106) refers to the tendency exhibited by many Helices to have at least two abruptly marked forms, a larger and a smaller one. He says—"I have indeed been shown specimens by Sir Chas. Lyell of the *H. hirsuta* Say from N. America, one state of which is considerably more than double the dimensions of the other; and I believe it is a well known fact that intermediate links have not yet been observed to connect the extremes." So far, however, as my experience teaches, I must say that, without exception, the extremes in N. American Helices are connected by others of intermediate sizes.

The tendency of species, in different groups of the same genus, to vary as regards form in a similar direction, is certainly curious. *H. palliata* Say, with whorls convex above, and an obsoletely angulated periphery, has a variety with flattened, sub-exserted whorls, and carinated periphery. The same differences exist between *H. Carolinensis* Lea and *H obstricta* Say, and although in a less degree in forms of *H. appressa* Say. There is also the same relation between *H. hirsuta* Say and *H. spinosa* Lea, and I may add between *H. Troostiana* Lea and *H. fastigans* L. W. Say.

In the species without teeth there appears to be less tendency to carination,—but *H. Cumberlandiana* Lea has the same relation to *H. alternata* Say as *H. obstricta* to *H. palliata.* There is also a carinated variety of *H. intertexta* Binney.

It is worthy of remark that the *striæ* in *H. alternata* and *H. palliata* are replaced by *costæ* in *H. Cumberlandiana* and *obstricta.*

The geographical distribution of the carinated forms above mentioned is interesting. None are found in the Eastern or Middle States; they inhabit chiefly Kentucky, Tennessee, Alabama, and Georgia,—Tennessee being their metropolis.

Darwin (Origin of Species, p. 143, Amer. Ed.) states the following propositions,—" distinct species present analogous variations; and a variety of one species often assumes some of the characters of an allied species, or reverts to some of the characters of an early progenitor." He gives as a case of analogous variation in the vegetable kingdom, the enlarged stems of the common turnip, Swedish turnip, and Rutabaga, remarking that, " according to the ordinary view of each species having been independently created, we should have to attribute this similarity in the enlarged stems of these three plants, not to the *vera causa* of community of descent, and a consequent tendency to vary in a like manner, but to three separate yet closely related acts of creation." I certainly am not prepared to accept community of descent as the cause of analogous variation in the American Helices above mentioned.

In connexion with the subject of variation, I may refer to the great length of time during which species have been perpetuated without alteration. In the Post-pleiocene beds of the Southern States a considerable number of the Helices and other land, and also fresh water species, occur identical with those now living. *H. labyrinthica* Say, widely distributed in North America, is said to be an Eocene fossil in England.

When species have well defined colors, or colored bands, or other ornamentation, uniformly pale individuals are usually noticed as varieties. I have such, in my cabinet, of the following Helices, viz.: *alternata*, *solitaria*, *albolabris*, *multilineata*, *perspectiva*, *thyroides*, *interna*, *profunda*, *Pennsylvanica*, *palliata*, *inflecta*, *tridentata*, *fallax*, and *hirsuta*.

In North America there is no species of Helix which, in its normal state, is *sinistral*, but I may record that I have reversed *H. alternata*, *thyroides*, and *Mitchelliana;* W. G. Binney has *H. fallax*, Mr. Isaac Lea *H. hirsuta*, and Mr. Anthony, I believe, *H. inflecta* and *H. solitaria*.

LIST OF FIGURES ON PLATE IV.

Fig.	1–2.	Helix	espiloca Ravenel,	Ann. Lyc.	VII.	p. 115
“	3–4.	“	introferens Bland,	“	“	p. 117
“	5–6.	“	Christyi “	“	“	p. 118
“	7–8.	“	Wheatleyi “	“	“	p. 119
“	9–10.	“	Postelliana “	“	“	p. 35
“	11–12.	“	triodontoides “	“	“	p. 424
“	13–15.	“	polygyrella Bland and Cooper,	“	“	p. 365
“	16–17.	“	Mullani “	“	“	p. 363
“	18.	“	Edgariana Lea (twice nat. size),	“	“	p. 428
“	19.	“	labrosa Bland (“),	“	“	p. 430
“	20.	“	septemvolva Say,	“	“	p. 441
“	21–22.	“	vultuosa Gould,	“	“	p. 439
“	23–24.	“	Downieana Bland,	“	“	p. 420

XXXVIII.—*On the Occurrence, within the Limits of the United States, of Barrow's Golden Eye,* BUCEPHALA ISLANDICA (Gmel.) Baird.

BY D. G. ELLIOT, F.Z.S.

Read January 27th, 1862.

WITHIN a few years past, certain species of ducks (always before considered as natives of other countries, or else restricted in their migrations, by unknown causes, to the distant seas of the frozen north, but never wandering so far to the southward as to approach within the boundaries of the United States), have been discovered hanging up at the stalls of the different poultry venders in the Fulton and Washington Markets of this city.

Among the species, I may here mention the *Mareca Penelope*, or English Widgeon, first noticed by Mr. George N. Lawrence, in a communication to J. P. Giraud, Esq., and published by the latter gentleman in his "Birds of Long Island."

Mr. Lawrence obtained his specimen in Fulton Market, but it was unfortunately picked, with the exception of the head and upper part of the neck and wings. Since that time this duck has been frequently shot along our coast, and has very properly been included as belonging to our fauna, and not a mere straggler to our shores. I have a very fine specimen in my cabinet in perfect plumage, of a male of this species, which was killed in the state of Illinois in the vicinity of Chicago, thus leaving no doubt upon my mind that these birds are accustomed to ascend and descend the Mississippi river in their annual migrations, and are in all probability to be met with during the spring and fall, associating with the myriads of ducks found upon the prairies of the far west.

Another species, now considered as justly belonging to the Birds of America, is the *Nettion Crecca*, or English Green

Winged Teal. I well remember the occasion when this bird was first observed here; how long before the species had been accustomed to frequent our shores it would be difficult to say.

I happened one day to call at the rooms of our skilful Taxidermist, Mr. John G. Bell, and found him engaged in preparing a Teal for mounting, and while handling the bird we noticed that it was wanting in the conspicuous white bar in front of the wings, always to be found in our common species at that period of the year, early spring. This led us to examine it more closely, when we soon perceived that it was the European species.

Since that time, Mr. Bell, always on the watch for these birds, has been fortunate enough to obtain, at various periods, a good many specimens.

Thus, from time to time, has the fauna of the United States been increased by species, which always before were deemed as belonging to the old world, and if they had been isolated cases, it would have been fair to suppose them mere stragglers, turned from their accustomed routes by violent storms, or other unknown causes; but in regard to the two species, referred to above, so many have followed their pioneer, if I may so call the first arrival, that it is no longer a matter of doubt, that they may with propriety be considered as much an inhabitant of the land as any other species of migratory birds.

Although the species, whose name stands at the commencement of this article, is well known as an inhabitant of our high latitudes, and is even occasionally met with upon the river St. Lawrence during the winter, yet it has never been recorded as having been observed within the limits of the United States, and, therefore, it is with pleasure I am able to state, that lately several specimens have been obtained within our boundaries. Not long ago Mr. Bell's assistant, Mr. Francis McCulloch, told me that he had seen in Washington Market a curious Golden Eye. It looked like a female, but had a white mark near the bill in the form of a crescent. Satisfied in my own mind that it was a young male of *Bucephala Islandica*, I told him so, and desired him to keep a sharp look-out for another. Soon after he showed me a fine adult male of that species which he had obtained the day previous. On inquiring if there were no more, he was not sure, so I went to the Washington Market myself, and found there were still hanging at the stall two adult females and a young male, along with three females of the common species. The market-man said they came from out west, in all probability from the neighborhood of one of the great lakes, and both species coming together, I suppose that they were in company before they were killed.

Barrow's Golden Eye was first described, I believe, by Gmelin in his Syst. Natur. 1788, p. 541, under the name of *Anas Islandica*, and by Swainson and Richardson in the Fauna Boreali Americana by the appellation of *Clangula Barrovii*, or Rocky Mountain Garrot.

Audubon considered it but a variety of our common species, and placed the names given by the above authors among its synonyms.

Macgillivray also, in his History of British Birds, in the second volume of the Water Birds, page 183, was not at all inclined to admit the *Bucephala Islandica* as a good species, and says that "it presents no other differences, that are not met with in undoubted specimens of *Clangula chrysophthalma* (the European representative of *Bucephala Americana*), than that of having a semilunar white band before the eye, in place of an ovate or oblong band and a transverse black band on the white of the wing. In his opinion, these crescent spotted individuals, as he calls them, are young males in their second or third year, and he proceeds to show why the various differences in the markings are but the evidences of immaturity.

Now at this late day it is but time wasted to argue the specific differences of these birds, it being generally conceded by Ornithologists that Barrow's Golden Eye is a species distinct from its relative the *Bucephala Americana.*

It only requires that the two species should be brought together, for the peculiar characteristics appertaining to each to be recognised at a glance, as regards the males; the females I must admit require more extended investigation.

As a general thing the *Bucephala Islandica* is a larger bird than its relative, but the first object of difference in the males which would probably attract attention, is the white spot anterior to the eye, which, in the former species, occupies the entire side of the bill, and runs up to a point on the forehead, while that of the *Bucephala Americana* is of an oval shape, lengthened longitudinally, and not reaching above the base of the upper mandible.

Another marked difference is in the color of the head, which, in the species last mentioned, is of a bright glossy green, while the other is of a deep rich blue, with purple reflections. This color extends much further along the neck in Barrow's bird than in our common species, leaving but a small portion of it a pure white.

The *Bucephala Americana* has the white on the wings a continuous patch with a concealed black bar on the bases of the greater coverts, while the other has the greater coverts black, tipped with white, which is continuous with the white secondaries.

The scapulars of the common Golden Eye are long and comparatively narrow, white margined with black, while those of its relative are much broader, the white portion of the feather of a squarer form, with its black margin quite wide. There is a little difference in the shape of the scapulars between the two species, which it may be as well here to notice, for in all the examples that I have seen it has occurred, viz. that while those of the *Bucephala Americana* are almost square at their termination, those in its prototype have the black margin elongated considerably beyond the white, which latter portion is rounded.

The bills are very dissimilar; that of our well known species being lengthened, and rather depressed at its base, while that of Barrow's bird is very high at the base and very short; the measurement of the specimen before me being an inch and a quarter high at the base, by one and three quarter inches in length. The size of the bills in both species varies considerably (I have a female of *Bucephala Islandica* with the bill not quite an inch by an inch and a quarter long), but never have I seen the *largest bill* of the last named species equal in size to the smallest one of *B. Americana.*

The color on the sides, and under tail coverts of the common bird, is not so extensively distributed, nor so dark as in the Rocky Mountain Garrot.

The females of the two species closely resemble each other, the principal difference consisting in the smaller bill and darker color of the head of *B. Islandica*, which is a very dark brown, while the other species is snuff color,—in its larger size, and in having, like the males, the color of the head to extend further down the neck.

As with the males, the females of Barrow's Golden Eye have the sides, upper part of the breast, and under tail coverts of a much darker hue (and more extended, particularly on the lower part of the abdomen), than those of our common species, and this dark color is separated from the pure white of the breast, by an irregular line of light brown. The color of the eyes is very different, that of *B. Americana* being a pale yellow, while its relative's is a reddish orange.

The young male is still in the livery of the female, but is considerably larger in size, the head much darker, being of a blackish brown, and the upper part of the breast is nearly of a uniform white with the lower parts, and the white is commencing to show upon the flanks.

The black bar on the wing, so plain in the female, and so conspicuous in the old male, has hardly made its appearance in the present example, and but a single feather of the scapulars has the white and black markings of the adult male. The rest of the back is like the female, but darker.

The following are the respective measurements of the two species, which will serve more readily to give an idea of their relative size.

	Sex.	*Species.*	*Length.*	*Str'ch of w'g.*	*Wing.*	*Weight.*
	♂	*Bucephala Islandica.*	20.00.	31.50.	9.75.	lb. 2 oz. 6½.
	♀	do.	19.00.	30.00.	9.00.	" 2 " 5.
jne.	♂	do.	20.00.		9.50.	
	♂	*Bucephala Americana.*	19.00.		9.00.	
	♀	do.	16.00.		8.50.	

Thus has one more species of the family of the Ducks been found to frequent our shores, as a visitor at least, although I am strongly inclined to believe that it always has been accustomed to enter the United States during the winter, in small flocks probably, and has hitherto escaped the notice of ornithologists. It would, I think, be most likely to follow the course of the Mississippi river, and consequently, although perhaps often killed there, would, from the great distance intervening, be but seldom sent to the markets of our sea-board.

I am, at all events, satisfied that the examples before me are not the first which have been exposed for sale in this city, for Mr. Bell's assistant was particularly impressed with the peculiar appearance of the young male, which I have before mentioned, and although he did not know the *B. Islandica*, yet he was too well conversant with our common species to make any mistake in the matter, and it was by his keeping a sharp watch, after my describing to him the difference in the species, that he discovered the present specimens.

Doubtless many rare and curious birds are brought to the markets of this city, which never meet the eye of the Ornithologist at all, his procuring anything unusual being only the exception, and consequently it behoves everyone who takes an interest in this delightful study, never to omit examining any number of wild birds which he may meet exposed for sale at any of the markets he may have occasion to visit.

XXXIX.—*Descriptions of Six New Species of Birds, of the Families* CHARADRIDÆ, TROCHILIDÆ, *and* CAPRIMULGIDÆ.

BY GEO. N. LAWRENCE.

Read February 10th, 1862.

1. Aegialitis tenuirostris.

Female. Crown, occiput and back cinereous, the feathers with greyish-white margins; wing-coverts somewhat darker than the back, the ends of the larger coverts white, forming a transverse bar on the wing; primaries umber-brown with the inner webs lighter, except at the end, and having the shafts white; the secondaries are of the same color as the primaries and tipped with white; tertiaries paler and largely marked with white; scapulars ashy-brown, lighter on the inner webs and having both webs crossed with rather obsolete narrow brown bars; the middle upper tail coverts are pale ochreous-brown, the lateral ones white; the four central tail feathers are light ochreous-brown at the base, becoming darker towards their ends, the other tail feathers are white, those next the central ones being pale ochreous at the end; front, a line over the eye, cheeks, a collar on the hind neck, and entire under plumage pure white; a semi-collar of ashy-brown on each side of the upper part of the breast; bill black with a small space at the base of the under mandible dull orange; irides black; tarsi and toes purplish-black.

Length about $6\frac{3}{4}$ in.; wing $3\frac{7}{8}$; tail $1\frac{3}{4}$; bill from front $\frac{5}{8}$; tarsi $\frac{15}{16}$.

Habitat.—Cuba.

This species is allied to *A. melodus*, but is rather smaller; the bill is longer, depressed at the base, and regularly tapering to the end where it is comparatively sharp; in the latter it is quite obtuse and very different in form; there is less white on the quills, with more on the tail, and the tarsi are longer than those of *A. melodus*.

This specimen belongs to the collection of Dr. J. Gundlach, who sent it to me for examination, as probably new, accompanied by the following note.

"This specimen I obtained in the month of July near the port of Guantanamo, on the south coast of the eastern part of the island; it was a female, and was caught in a net while sitting on her nest, in which were three eggs; it is in full plumage, I could not find the male nor a single individual more. Its bill was black, with the base on the under part grey, and the legs of the same color with a purple tint; eyes very black. Length 0.170; extent 0.337; tail 0.045; the ends of the wings were 0.004 from the end of the tail, not beyond it."

2. Thalurania Luciæ.

Male. Crown metallic deep blue, hind part of the head greenish-blue; upper plumage and wing coverts grass-green, with a slight golden tinge on the back; tail steely blue-black and deeply forked; wings dark violet purple; entire under plumage shining grass-green, under tail-coverts green; upper mandible black, the under black, except on the sides, where it is pale yellow for about half its length from the base, the lighter color gradually merging into the darker; the tarsi are clothed with white feathers, slightly tinged with brown on the front part; toes ashy on the upper surface and underneath very pale yellow, claws brownish-black.

Length about 4½ in.; wing 2⅝; tail 1⅞; bill $\frac{11}{16}$.

Habitat.—Tres Marias Islands, Mexico.

This species at first sight bears a close resemblance to *Thal. glaucopis*, but is a little larger, with the bill rather shorter; in the color of the crown they are much alike, but in the present bird the wings are darker, as is also the green of the under plumage, which in the other has more of a yellowish shade. In the Brazilian bird the bill is entirely black, the covering of the thighs dark-brown tipped with white, and the feet brown above and bright yellow below, whereas in the new species the bill is partly yellow, the thighs nearly pure white, and the feet very pale.

This, I believe, is the most northern point at which any of this genus have been found, only one other species ranging north of the Isthmus of Panama, viz. *T. venusta* from Costa Rica.

I have named this beautiful species in compliment to Miss Lucy, the young and interesting daughter of my friend Prof. S. F. Baird.

3. Chlorostilbon insularis.

Crown brilliant orange yellow, upper plumage shining golden green; under plumage glittering green, on the throat of a bluish shade and on the abdomen and sides golden; under tail-coverts grass-green; tail steely blue-black, and slightly emarginate; wings light brownish-purple; upper mandible black with the exception of the nasal grooves at the base of the bill which are flesh color, under mandible yellow with the end dark-brown; tarsi clothed with sooty feathers, feet blackish-brown.

Length $3\frac{1}{8}$ in.; wing $1\frac{7}{8}$; tail $1\frac{1}{8}$; bill $\frac{9}{16}$.

Habitat.—Tres Marias Islands, Mexico.

In its dimensions and the color of its plumage this species is almost precisely like *C. prasinus*; it differs, however, in the bill being narrower and in the ridge of the upper mandible being black from the base; in *prasinus* the bill is broader at the base, and the upper mandible is flesh-color for about half its length, the terminal half dark.

This and the preceding species are in a collection of birds made by J. Xantus, Esq., in July of last year, on the Pacific coast of Mexico and the neighboring islands, and were lately sent to me for examination from the Smithsonian Institution.

It is quite remarkable that these two species should so closely resemble two others from south-eastern Brazil, a locality so widely different.

Three other species were obtained by Mr. Xantus at the Tres Marias Islands, viz. *Florisuga mellivora* (Linn.), *Cyanomia Gautemalensis* (Gould), and *Petasophora thalassina* (Sw.).

4. Trochilus aurigularis.

Male. Upper plumage shining green, on the head, hind neck, and upper part of the back, of a bronzed or coppery shade; two central tail-feathers of a rather dull bronzed green, the other tail-feathers brownish-purple; wings brownish-purple; chin black, throat brilliant metallic golden green, on the upper part and lengthened lateral feathers of the gorget the color is deep orange, and on the tips of some of the feathers intensified to brilliant red; below the gorget is a whitish band becoming ashy-grey on the breast, which is also the color of the abdomen and sides, the latter washed with dull green; the bill is pale yellow; feet light brown, claws yellowish-white.

Length 3⅜ in.; wing 1½; tail 1⅛; bill ⅝.

Habitat, unknown.

This appears to be a third species of the genus Trochilus, as now restricted, the other two being our familiar *T. colubris* and *T. Alexandri*, from Northern Mexico and California. The tail in the present species is precisely of the same form as in the others, all have the chin black, with a brilliant gorget succeeded by a band of whitish feathers, and ashy under plumage.

The above specimen was in spirits, which, perhaps, has deepened the colors somewhat, but I think they have not changed materially.

This species was also sent from the Smithsonian Institution for examination; it was in a bottle by itself without collector's name or locality being given, and Prof. Baird did not know whence it came.

5. Sapphironia luminosa.

Upper plumage glittering grass-green, inclining to golden on the rump, the crown not so bright and of a very deep green; entire under surface of a very brilliant bluish green, the sides of the neck golden orange; tail forked and of a rich steel blue, the two middle feathers green like the rump, the next feather bronzed on the outer web at the end; wings dull purple; under tail-coverts deep green, very narrowly edged with bluish-white, thighs clothed with greyish white feathers; upper mandible black, under yellowish with the end black; feet and claws black.

Length $3\frac{3}{4}$ in.; wing $1\frac{7}{8}$; bill $\frac{11}{16}$; tail $1\frac{1}{4}$.

Habitat.—New Granada.

A single specimen was in a small collection of birds, made at Barranquilla by Geo. Crowther, Esq.

It somewhat resembles *S. Goudoti*, but is of a darker green and altogether a more brilliant bird; it is below of a deep bluish-green, without any wash of golden on the abdomen, as in the other; the tail-feathers are narrower, and of a clearer steel blue; the under tail-coverts are dark green with a mere fringing of grey, those of *Goudoti* being greyish-white with their centres pale green.

6. Stenopsis maculicaudus.

First and second quills nearly equal, the first slightly the longest, tail even, except that the central feathers extend a little beyond the others; tarsi feathered in front for half their length.

Front and upper part of the head black, sparingly marked with small spots of rufous; a broad band of pale rufous extends from the bill along the edge of the crown to the hind head; there is a black patch behind the eye and a broad one underneath it; on the hind neck is a band of mottled grey, succeeding which is a nuchal collar of rufous; the back and upper tail-coverts are black crossed with irregular fine lines of pale rufous and grey; the two central tail-feathers are black, crossed with distinct bands of mottled ashy-grey, tinged on their outer margins with pale rufous; the other tail-feathers are nearly black or of a deep blackish-brown, pure white at their ends for rather over half an inch, with a row of nearly round pure white spots (one on the inner web of each feather), crossing about two inches from the end, and a similar row about an inch from the base of the tail, on the outer webs are a few irregular marks of light rufous; quills blackish brown, the primaries marked with light rufous spots on each web for three-fourths their length from the base; the secondaries sparingly marked and ending rather broadly with pale rufous; tertiaries black with a broad stripe of light rufous on the outer edge of each feather; wing coverts black, freckled with rufous and grey, and having a triangular pale rufous spot at the end of each feather; under wing coverts light rufous; throat pale rufous, some of the feathers narrowly ending in black; on the upper part of the breast the feathers are black at the base, largely rufous-white at their ends; the feathers of the breast are crossed with narrow transverse black lines; abdomen, thighs, and under tail-coverts pale rufous, a few black bars on the upper part of the abdomen and sides; bill black; feet flesh-color, claws brown.

Another specimen has a greater prevalence of rufous in its plumage, the spots on the head being larger and the decided grey band on the hind neck not so apparent.

Length about 8 in.; wing $5\frac{1}{8}$; tail 4; bill $\frac{7}{16}$; tarsi $\frac{8}{16}$.

Habitat—Para. Collected by Mr. v. Schulte Buckow.

From the pure white character of the markings on the tail I judge these examples to be probably males.

The most distinguishing characteristic of this species appears to be the two rows of distinct white spots crossing the tail. The size is about the same as that of *Antrostomus Nuttallii*, with the same style of markings on the primaries, but in that species the spots extend to the ends of the feathers; in the white terminal band on the tail they precisely resemble each other.

XL.—*Catalogue of a Collection of Birds, made in New Granada, by James McLeannan, Esq., of New York, with Notes and Descriptions of New Species.* Part III.

BY GEORGE N. LAWRENCE.

Read February 10, 1862.

(Continued from page 334.)

AT the time of publishing Part II. of this Catalogue, there were some species which I considered new, but before deciding desired to submit them to higher authority, as they were in families with which I did not feel very conversant.

P. L. Sclater, Esq., of London, having kindly consented to examine those species, I sent them to him with descriptions for publication in the " Ibis," in case he should coincide with me in opinion. I am happy to say that he did so, and the descriptions accordingly appeared in that magazine.

At the same time I sent to Mr. Sclater, for verification, several of the species enumerated in Parts I. and II., as to which I had doubts, and also those which I had not determined. Some of the former proved to have been erroneously referred,—Mr. Sclater was unable to recognise others. In the present part of the Catalogue I publish corrections of the errors, and descriptions of such of the species as, on further examination, I believe to be new. As the species undetermined by me, were unknown to Mr. Sclater, I now feel justified in describing them, and accordingly do so.

I add some further species, forwarded by Mr. McLeannan (who remained on the Isthmus), since the transmission of his former collections.

FAM. FALCONIDÆ.

SUBFAM. AQUILINÆ.

295. *Thrasaëtus harpyia* (*Linn.*).

SUBFAM. FALCONINÆ.

296. *Hypotriorchis rufigularis* (*Daud.*).

SUBFAM. ACCIPITRINÆ.

297. *Accipiter collaris*, *Scl.* ♂, juv., Ibis Vol. 11, p. 148, pl. VI.

This specimen agrees very well with the description and figure of the young of this species, as cited above.

298. *Micrastur semitorquatus* (*Vieill.*).

FAM. STRIGIDÆ.

SUBFAM. BUBONINÆ.

299. *Scops choliba* (*Vieill.*).

SUBFAM. SYRNIINÆ.

300. **Syrnium lineatum**, sp. nov.

Male. The plumage above is dark brown, each feather crossed with several narrow waving lines of dull pale rufous; tail blackish brown crossed with fine narrow bars of light greyish brown, the tip lighter grey; quills brown with light greyish brown bars; a superciliary mark of pale rufous; the ruff in front has the ends of the feathers cream-colored white; sides of the neck and of the breast dusky brown, with indistinct transverse lines of pale dull rufous; neck in front and abdomen rather light rufous, with broad longitudinal brown stripes; legs brighter rufous than the abdomen, crossed in front with narrow dusky lines and feathered to the toes; bill plumbeous with the culmen and ends of both mandibles yellow; toes brown above, yellowish underneath.

Length 12 in.; wing 8½; tail 5; bill 1¼; tarsi 1⅜.

In appearance this species is much like *S. virgatum* Cass, but is smaller; the upper plumage is not so dark, being greyish, and the markings much smaller and more numerous; the under plumage is rather more rufous, with the stripes fewer and less distinct.

FAM. TROGONIDÆ.

SUBFAM. TROGONINÆ.

301. **Trogon concinnus**, sp. nov.

Male. Front, crown, sides of the head and throat black; occiput, hind neck, and upper part of the breast bronzy bluish-green; back golden-green; rump and upper tail coverts deep green; two middle tail feathers bronzy green, just edged with black, the next black with the outer margin green, the next wholly black, the next or third lateral feather black with white bars on the outer web and ending with white, the two outer ones barred with black and white and ending with white; wings black, the primaries edged with white on their outer margins towards the base; the smaller wing coverts are crossed with very fine waving grey lines; the middle coverts and outer webs of the secondaries conspicuously crossed with white lines; middle of the breast, abdomen, and under tail coverts deep orange; sides of the breast and under the wings dark cinereous; tarsi clothed with black feathers; upper mandible plumbeous, the under and edges of the upper yellowish; feet black.

Length 9 in.; wing 4¾; tail 5¼.

Female. Entire upper plumage, head, throat, and chest dark slate; wing coverts and outer webs of secondaries crossed with white lines; breast, abdomen, and under tail coverts orange.

I am not able to make this agree with any of the described species of this genus. It comes nearest to *T. caligatus*, but differs in being more bronzy on the back, in the hind neck and gorget being of a rather dull green instead of blue, the upper tail coverts clear green not bluish green, and the two central tail feathers dull bronzy-green instead of greenish-blue; the ends of the tail feathers are rounding, whereas in *caligatus* they are square with an even terminal black bar; in the latter the white and black bars on the outer tail feathers are very decided and regular, in mine they are quite irregular; the middle wing coverts and secondaries are marked with distinct white lines, instead of the very fine ones like those on the smaller coverts, as in *caligatus.*

FAM. BUCCONIDÆ.

SUBFAM. BUCCONINÆ.

302. *Bucco pectoralis, G. R. Gray.* ♂ and ♀.

Excellent specimens of this rare species; the wing coverts and scapulars have their ends narrowly margined with white.

Male. Length $8\frac{1}{4}$ in.; wing $3\frac{7}{8}$; tail $3\frac{5}{8}$; bill $1\frac{3}{16}$; tarsi $\frac{5}{8}$.

FAM. CÆREBIDÆ.

SUBFAM. CÆREBINÆ.

303. **Dacnis venusta,** sp. nov. No. 166 of Part II.

Male. The front, lores, region of the eye, face, and chin, are black; upper plumage, with the ends of the small and middle wing coverts light verditer blue, this color extends over the cheeks and quite forward on the sides of the neck; wings, greater wing coverts, scapulars, upper tail coverts and tail deep blackish purple; under plumage of a very dark rich green (not in a good light appearing to be black); thighs of a bright minium or deep orange-red color; tarsi and toes flesh colored brown; bill black.

Length $4\frac{1}{2}$ in.; wing $2\frac{5}{8}$; tail $1\frac{7}{8}$; bill $\frac{7}{16}$; tarsi $\frac{9}{16}$.

Female. Above bluish-green, middle of the back dark green, sides of the neck and rump verditer blue; wings and tail dark brownish purple; throat and upper part of breast ashy grey; breast, abdomen, and under tail coverts fulvous or tawny yellow, deeper in color on the latter; sides dusky; thighs pale orange red; legs and bill as in the male.

The blue of the upper plumage is much the same as that of *D. melanotis*, but rather brighter. The interscapulary region is blue, the scapulars only being purplish-black; the black around the eye is confined to a small space, and ends in a point immediately behind it; the blue of the neck extends quite forward on the throat, contrasting finely with the deep green of the under plumage; the blue wing coverts form a broad band across the wing. In its dark under plumage and bright red thighs it is totally unlike any other species.

I thought it was an undescribed species from the specimen of the female enumerated in Part II., which has been confirmed by the fortunate acquisition of the male.

Fam. TROCHILIDÆ.

Subfam. TROCHILINÆ.

304. *Chrysuronia Eliciæ, Bourc. et Muls.*
305. *Lophornis Delattrei, Less.*

Fam. DENDROCOLAPTIDÆ.

Subfam. SCLEURINÆ.

306. *Scleurus Mexicanus, Scl.?*

Differs from a specimen of this species sent me by Mr. Sclater, in being rather smaller, in the rufous on the throat being paler, the bill shorter, and the quills much darker. These differences may be owing to sex or age, my specimen is a male. Length $6\frac{1}{8}$ in.; wing 3; tail $2\frac{1}{4}$; bill $\frac{13}{16}$; tarsi $\frac{13}{16}$.

Subfam. SYNALLAXINÆ.

307. **Automolus pallidigularis,** sp. nov.
Anabates ochrolæmus, Lawr. nec Tsch., No. 177 of Part II.

Male. Upper plumage dark olive brown, the feathers of the crown with lighter centres; rump bright rufous; tail very deep rufous; the wings are rufous on the outer webs, with the inner webs along the shafts and at the ends dark brown; inner edges and under lining of the wings bright cinnamon color; throat pale buff or cream-colored white; ear-coverts brown with fawn-colored centres; circle round the eye and a narrow superciliary stripe running back from it fawn color; under plumage paler than the upper, with the sides dusky; bill light brownish horn color, with the base of the under mandible pale yellow; irides brown; legs yellowish brown.

Length 8 in.; wing 3¾; tail 3¼; bill $\frac{15}{16}$; tarsi ¾.

This is somewhat like *A. cervinigularis* Scl., but the bill is much stouter, the crown not so dark, and the throat very much paler, the superciliary stripe is less conspicuous and the tail of a deeper rufous. This species was sent Mr. Sclater for examination, who decided it was not "*ochrolæmus*," to which I had doubtfully referred it.

No. 62 of Part I., which was referred by me to *cervinigularis* Scl., was not in good condition, and the bill much injured; it appears to be the same as the species now described.

SUBFAM. DENDROCOLAPTINÆ.

308. *Dendromanes homochrous*, Scl. P. Z. S. 1859, p. 382.
Dendrocincla ——, No. 183 of Part II.

Identified by Mr. Sclater.

309. **Dendrocincla olivacea,** sp. nov.
" *fumigatus, Lawr. nec Licht.*
No. 182 of Part II.

The general plumage is of a clear brownish olive, rather lighter on the under parts; the ends of the upper tail-coverts and tail deep ferruginous, the shafts of the tail-feathers black; lores and chin ashy grey; a blackish line runs from the upper mandible to the top of the eye, and there is an oblong spot of the same color under the eye; running back from the upper part of the eye is a narrow line of pale rufous; quill feathers deep rufous, the ends of the primaries brown; under wing-coverts and inner webs of quills bright cinnamon; bill brownish-black, the under mandible whitish underneath; tarsi and toes black.

Length 8 in.; wing 4; tail 3½; bill 1; tarsi ⅞.

In placing the species as *D. fumigatus* in Part II., I felt doubtful as to its correctness, and sent it to Mr. Sclater for examination. He wrote me that it was not *fumigatus* and was more like *D. atrirostris* Lafr.; it appears to differ from the latter species, in having the lores grey, and blackish marks in front of and under the eye; in the wings and tail being deep rufous, these in the other are given as cinnamon color, with the tail-coverts only ferruginous red; in my species the bill is not entirely black. Although closely allied I think they are distinct. *D. fumigatus* has a clear rufous band over and another below the eye, with the under plumage reddish brown.

310. **Dendrornis lachrymosus,** sp. nov.

" ——, No. 48 of Part I.

Head, upper part of back, and small and middle wing-coverts dark brown, closely covered with tear-shaped spots of a pale fulvous or fawn color, the centre of each feather being of this color with dark edges, these spots are quite small on the front and increase in size to the back where they are comparatively large; the larger wing-coverts are bright rufous on the inner webs, the outer have a pale rufous stripe along the shaft with the outer edge black; lower part of back, wings, and tail deep bright ferruginous, the ends of the primaries dusky; inside of wings cinnamon-red; throat fawn-color, neck and breast closely spotted like the back; abdomen, sides, and under tail-coverts dull greyish-brown, obscurely striped with fulvous yellow, the latter tinged with dull rufous; bill light horn-color, with the base of the under mandible dull orange; tarsi and toes dark brown.

Length 9½ in.; wing 4¾; tail 4¼; bill 1½; tarsi ¾.

FAM. TROGLODYTIDÆ.

SUBFAM. TROGLODYTINÆ.

311. *Cyphorinus philomela, Salv.* P. Z. S. 1861, p. 202.

" *bambla, Lawr. nec Bodd.* No. 185 of Part II.

Resembles *C. bambla*, but wants the white bar on the wing I felt doubtful about referring it to that species,—the specimen being a female, I considered that the absence of the bar might be a sexual difference.

It was described by Mr. Salvin just previous to the date of my catalogue.

FAM. MNIOTILTIDÆ.

SUBFAM. MNIOTILTINÆ.

312. *Dendroeca Blackburniæ* (*Gm.*).
313. *Myiodioctes Canadensis* (*Linn.*).
314. *Oporornis formosus* (*Wils.*).

FAM. VIREONIDÆ.

SUBFAM. VIREONINÆ.

315. *Vireolanius pulchellus*, *Scl.* Ibis, Vol. 1, 1859, p. 12.

FAM. FORMICARIDÆ.

SUBFAM. FORMICIVORINÆ.

316. **Myrmetherula fulviventris,** sp. nov.
" ——, No. 215 of Part II.

Male. Above dull olive-brown; tail rufous-brown with brighter margins; quills dark brown edged with pale rufous; smaller wing-coverts the same color as the back, the other coverts blackish-brown with distinct pale rufous spots at the end; under wing-coverts and inner edges of quills of a pale reddish-buff; throat black, with a white spot at the end of each feather; breast and abdomen of a dull fulvous color, the sides of the breast dusky olive; upper mandible blackish horn-color, the lower whitish; irides brown; tarsi and toes brownish-yellow.

Length 3⅞ in.; wing 2; tail 1⅜; bill ½; tarsi ⅝.

Female. The upper plumage is more olivaceous than in the male; the wings are similarly spotted, but the throat is without spots, the entire under plumage being of a tawny or fulvous color, rather brighter than in the male.

Allied to *M. gularis*, but that species is cinereous below and has a shorter tail.

317. *Formicivora Boucardi, Scl.* P. Z. S. 1858, p. 300.
" *Quixensis, Lawr. nec Corn.* No. 217 of Part II.

The two species are closely allied, but *Boucardi* is not so large, and the white spots on the wings are smaller.

318. **Ramphocænus semitorquatus,** sp. nov.

Male. Upper part of the head and hind neck rufous-brown; back and wing-coverts olivaceous-brown, tinged with rufous; tail dull rufous-brown, but broadly blackish-brown at the end, with the extreme tip greyish; wings blackish-brown with rufous brown edgings; cheeks and sides of the neck light rufous connected by a band of the same color on the hind neck; throat greyish-white with a black line separating it from the rufous cheeks, and a single row of longitudinal black stripes across the upper part of the breast; breast and abdomen dark greyish cinereous, whitish in the middle of the abdomen, and with a brownish tinge on the lower part; upper mandible black, the under white; legs black.

Length 4 in.; wing $2\frac{1}{8}$; tail $1\frac{1}{8}$; bill $\frac{3}{4}$; tarsi $\frac{7}{8}$.

This species resembles *R. cinereiventris* Scl., but appears to differ in having the head differently colored from the back, in there being no postocular mark, and in having a nuchal collar; Mr. Sclater states that his species has the throat striated like *R. rufiventris*, whereas in mine the throat is clear grey, a few black marks existing only on the lower part of the neck, or upper part of the breast. In the figure of *R. cinereiventris*, P. Z. S. 1855, pl. 87, the rufous of the sides of the head extends over and beyond the eye, in mine it terminates at the middle of the upper eyelid.

With these differences I can but regard them as distinct.

319. **Myrmeciza ferruginea,** sp. nov.
Pithys rufigularis, Lawr. nec Bodd. No. 58 of Part I.

I sent this species to Mr. Sclater for verification, but it proved to be unknown to him, and he considers it to be a Myrmeciza. I have therefore described it as a new species of that genus. In placing it provisionally as *Pithys rufigularis*, I had doubts as to its generic as well as specific position being correct. For its description see Part I. antea, p. 293.

FAM. TURDIDÆ.

SUBFAM. TURDINÆ.

320. **Turdus obsoletus,** sp. nov.

Male. Upper plumage of a very dark brown inclining to reddish olive; the feathers of the back are crossed with numerous nearly obsolete dark lines; tail dark brown on the inner webs, the outer ones the color of the back; quills blackish brown, the outer webs like the back, the ends of the greater wing-coverts are marked with triangular light rufous spots; under wing-coverts and inner edges of quills light cinnamon, paler on the latter; under plumage umber-brown, much lighter than the back, each feather is marked with a darker colored (rather obscure) spot at the end, giving a peculiar indistinct mottled appearance to the under surface; the throat is marked with dull brown stripes, between which are small ashy grey spots; lower part of abdomen and under tail-coverts white; bill blackish-brown; tarsi and feet dark brown.

Length $8\frac{1}{2}$ in.; wing $4\frac{5}{8}$; tail $3\frac{1}{2}$; bill $\frac{13}{16}$; tarsi $1\frac{3}{16}$.

321. *Heleodytes albobrunneus, Lawr.* Ibis, Vol. IV., p. 10.

FAM. TYRANNIDÆ.

SUBFAM. ATTILINÆ.

322. **Attila Sclateri,** sp. nov.
" *spadicea, Lawr. nec Gm.* No. 230 of Part II.

Female. Head and hind neck olive green, the feathers of the front with yellowish centres; back olive brown with a ferruginous tinge; rump and upper tail-coverts citron-yellow; tail brownish rufous with light rufous shafts; wings blackish-brown with pale rufous margins, the wing-coverts also edged with pale rufous; under wing-coverts and inner edges of quills pale cinnamon; throat, breast, and sides olive-green, rather obscurely striped with yellow; abdomen pale buffy white; under tail-coverts pale yellow; bill dark horn-color, lighter on the base and sides of the under mandible; legs dark plumbeous.

Length about 6 in.; wing 3¼; tail 2⅝; bill ⅞; tarsi ⅞.

This species I felt doubtful about and submitted it to Mr. Sclater for examination, who decided it to be undescribed; in compliment to him I propose distinguishing it by the name of *Sclateri.*

SUBFAM. TYRANNINÆ.

323. *Pitangus albovittatus, Lawr.* Ibis, Vol. IV. p. 11.

324. **Empidonax griseigularis,** sp. nov.
" *Bairdii, Lawr. nec Scl.* No. 236 of Part II.

Male. Third quill longest, second and fourth nearly as long and equal, first and fifth equal. Upper plumage olive-green; a narrow ring round the eye of pale yellow; tail olive-brown, the shafts reddish-brown; quill feathers dark brown, the secondaries and tertials narrowly edged with pale yellow; smaller wing-coverts olive-green, the others brown tipped with yellowish white, forming two bars across the wings; inner lining of wings pale yellow; throat of a clear whitish grey; under plumage pale sulphur yellow, with the sides of the neck, a band across the breast, and the sides under the wings, olivaceous; bill dark brown above, white beneath; tarsi and feet black.

Length 5 in.; wing 2⅝; tail 2¼; bill ½; tarsi ⅝.

This species I sent to Mr. Sclater for verification, but he writes me that it is distinct from *Bairdii*, and that he could not identify it. As I am unable to make it agree with any other species, I have described it as new.

In colors it is more like *E. acadicus* than any other of the genus, but is of a different form and much smaller, with the upper plumage rather more green, and the abdomen more yellow.

325. *Myiobius erythrurus, Cab.*
" *cinnamomeus, Lawr. nec Lafr. et D'Orb.*
No. 238 of Part II.

Sent to Mr. Sclater for examination, who pronounces it to be Mr. Cabanis' species.

326. **Leptopogon flavovirens,** sp. nov.
Tyrannula flaviventris. No. 239 of Part II.

Male. Upper plumage bright yellowish-green, rather darker on the head; tail-feathers olive-brown with yellowish green margins, the shafts blackish-brown; quills dark brown bordered with yellowish-green; smaller wing-coverts the color of the back, the others dark brown broadly marked at the ends with pale yellow, forming two conspicuous bars on the wing; under wing-coverts light yellow; circle round the eye white; under plumage rather light yellow, greyish on the chin, and having the sides of the neck and of the breast greenish olive; upper mandible dark horn-color, the lower yellowish with the end dusky; irides brown; legs black.

Length $4\frac{3}{4}$ in.; wing $2\frac{1}{8}$; tail 2; bill $\frac{7}{16}$; tarsi $\frac{11}{16}$.

A more careful comparison of this bird with the species in the Phil. Acad., with which I supposed it to be identical, has satisfied me that it is distinct.

I have therefore given it another name, and as Mr. Sclater considered it a Leptopogon, have placed it in that genus.

327. *Legatus albicollis* (*Vieill.*).
" *variegatus, Lawr. nec Scl.* No. 240 of Part II.

Submitted to Mr. Sclater, who determined it to be the allied South Amer. species, *L. albicollis.*

328. *Myiozetetes Granadensis, Lawr.* Ibis, Vol. IV. p. 11.

329 *Camptosoma imberbe, Scl.* P. Z. S. 1857, p. 203, pl. XIV.

330. *Tyrannulus brunneicapillus, Lawr.* Ibis, Vol. IV., p. 12.

331. *Tyranniscus parvus, Lawr.* Ibis, Vol. IV., p. 12.

Subfam. PLATYRHYNCHINÆ.

332. *Cyclorhynchus subbrunneus, Scl.* P. Z. S. 1860, p. 282.

333. " *æquinoctialis, Scl.*
" *brevirostris, Lawr. nec Cab.* No. 248 of Part II.

334. " *sulphurescens* (*Spix.*).
" *cinereiceps, Lawr. nec Scl.* No. 249 of Part II.

335. *Todirostrum schistaceiceps, Scl.* Ibis, Vol. I., 1859. p. 444.

336. *Oncostoma olivacea, Lawr.*
Todirostrum olivaceum, Lawr. Ibis, Vol. IV., p. 12.

In a note under this species in the Ibis, Mr. Sclater states, that in the catalogue of his collection now in preparation, he has proposed the generic term Oncostoma, for his *Todirostrum cinereigulare* and the present bird.

Fam. COTINGIDÆ.

Subfam. TITYRINÆ.

337. *Pachyrhamphus homochrous, Scl.* ♂ and ♀.

Subfam. PIPRINÆ.

338. *Heteropelma Verapacis, Scl.* ♂ and ♀.

Subfam. COTINGINÆ.

339. *Cotinga amabilis, Gould.*

Fam. FRINGILLIDÆ.

Subfam. PHYRRULINÆ.

340. *Spermophila lineata* (*Linn.*) ♀.
341. *Spermophila cinerea*, *Lafr.* ?

Male. Upper plumage, neck in front, sides of the breast and under the wings dark bluish slate; front and lores black; tail blackish-brown, with the edges the color of the back; quills blackish-brown, with a small white spot on the base of the primaries, a few of the larger wing-coverts tipped with white; axillars white; a spot on each side of the neck, middle of the breast and abdomen white, lower part of the abdomen mixed with bluish-slate; under tail-coverts dull slate terminating with white; bill pale yellow; tarsi and feet blackish-brown, claws dull yellow.

Length 4¼ in.; wing 2½; tail 1⅝.

This differs somewhat from specimens in the Phil. Academy, the color is darker, being more plumbeous, and the white neck spots are more distinct, these are only slightly apparent in some of the Philadelphia examples and do not show in others. If these differences are constant in other specimens, I propose to distinguish it by the specific name of *schistacea*.

Fam. RAMPHASTIDÆ.

Subfam. RAMPHASTINÆ.

342. *Selenidera spectabilis*, *Cass.* ♀.

Fam. PSITTACIDÆ.

Subfam. ARAINÆ.

343. *Ara macao* (*Linn.*).
344. " *severa* (*Linn.*).

345. **Psittovius subcœruleus**, sp. nov.

Female. The plumage generally is of a pale cœrulean or verditer blue, brightest above, the middle of the back a little obscure or inclining to grey, the under plumage lighter; the upper surface of the tail is of a clear greenish-blue, the feathers with narrow edgings of a lighter shade; the under surface of the tail is of a dull greyish-blue, the inner webs with grey margins; the shafts of the tail-feathers are dark brown above and whitish below; the smaller wing-coverts are dull greenish-blue, like the back, the middle coverts chocolate-brown with narrow bluish margins, the larger coverts greenish-blue with lighter margins; quills greenish-blue, brightest on the outer webs, a stripe of brownish purple along the shafts of the outer two primaries, shafts of the quill feathers dark brown; under wing-coverts white; the chin is pale orange-yellow; bill yellow, whitish at the end; feet yellow, claws yellow at the base and dusky at the end.

Length of skin 6¾ in.; wing 4½; tail 2¾; bill following the curve ⅞; tarsi ⅜.

SUBFAM. PSITTACINÆ.

346. **Pionius coccinicollaris**, sp. nov.

" *hœmatotis*, *Lawr. nec Scl.* No. 118 of Part I.

Male. Upper part of head and hind neck olive-green, the feathers of the crown with a bluish-grey tinge; lores dirty white; region under and behind the eye dark vinaceous, ending on the ear-coverts with a spot of bright red tipped with white; upper plumage bright dark-green; central tail-feathers green with dark blue ends, the others are red at the base on the inner webs and dark purple on the outer ones, all terminating with deep blue; primaries of a rich blackish-purple with their outer margins towards the end and the tips fulvous yellow; the outer webs of the primaries at the base dark blue; secondaries dark purple on the inner webs, the outer bright blue, edged with green; tertiaries the color of the back; wing-coverts green next the body, with those on the outer portion of the wing blue; spurious wing black with deep blue on the outer webs; throat dull purple narrowly bordered below with white, adjoining which is a rather broad collar (half an inch in width) of bright scarlet; under plumage bright green, of a golden tinge on the breast and under tail coverts; a large patch of deep scar[illegible] under the wings; under lining of wings and inner edges of qu. [illegible] bill yellowish white; feet yellow.

Length 9 in.; wing 5¾; tail 3; bill following the curve 1; tarsi ½.

The female (or possibly the young) differs only in having the collar quite indistinct.

The specimen of this species, enumerated in Part I., I suppose to be a female, as the collar is not well defined. I then felt quite well satisfied of its distinctness from Mr. Sclater's *P. hæmatotis*, but preferred waiting for more before deciding it to be so. The pair now received, with the conspicuous scarlet collar of the male, puts all doubt of its being distinct at rest. As stated at page 299, there is no appearance of the dark red margins to the feathers of the crown, which seems a strong character in *hæmatotis*.

FAM. PICIDÆ.

SUBFAM. PICINÆ.

347. **Chloronerpes callopterus,** sp. nov.

Male. Head above dark olive-brown with a broad occipital scarlet band; back and wings golden olive; rump dark olive-green; tail brown, bordered with olive, and without spots or bars; the outer feather pale cinnamon color in the middle on each side of the shaft, the next feather marked more narrowly in the same manner; the quills are bright cinnamon with spots and bars of black rather sparingly distributed, the primaries are brownish-black at their ends, most so on the outer ones; the secondaries and tertiaries are broadly margined with golden olive; a band of pale yellow runs from the bill along the side of the head under the eye, below which is a band of olive-brown; throat pale fulvous with dusky spots; breast olive green, with triangular spots of pale yellow; abdomen light yellow with transverse black bars; lower part of abdomen and under tail-coverts pale rufous; bill dark plumbeous, whitish at the base of the under mandible below; tarsi and toes brown.

Length about 7 in.; wing 4¼; tail 2¾; bill ¾; tarsi ⅝.

FAM. CUCULIDÆ.

SUBFAM. COCCYZINÆ.

348. *Coccygus erythrophthalmus* (*Wils.*).

FAM. COLUMBIDÆ.

SUBFAM. ZENADINÆ.

349. *Geotrygon violacea* (*Temm.*). ?

Male. Plumage above rufous-brown, the upper part of the back reddish-violet, crown and hind neck brownish; front, chin, abdomen, and under tail-coverts white; lower part of neck and breast light vinaceous, the feathers margined with pale rufous; tail very deep rufous; legs and bill yellow.

Length 9 in.; wing 5½; tail 3⅜; bill ⅝; tarsi ⅞.

It agrees quite well with Temminck's plate of this species, but the color on the hind neck is violet-red instead of violet-blue, and there is no appearance of the golden reflections; perhaps not fully adult.

FAM. TINAMIDÆ.

SUBFAM. TINAMINÆ.

350. *Tinamus robustus*, *Scl.* P. Z. S. 1860, p. 253.

Male. Above reddish brown, with transverse black markings most conspicuous on the wings and lower part of the back; top of the head dark brown intermixed with rufous, sides of the head and a broad collar around the neck bright rufous finely pencilled with black; throat white; under plumage ochraceous grey, crossed with numerous fine irregular markings of dark brown, larger on the sides; under tail-coverts light rufous, with broad brown bars on the outer edges of the feathers.

Length about 15 in.; wing 9; tail 3¾; bill 1⅛; tarsi 2½.

The specimen above described, I suppose to be Mr. Sclater's species, allied to *T. major.*

FAM. CHARADRIDÆ.

SUBFAM. CHARADRINÆ.

351. *Aegialitis vociferus* (*Linn.*).

FAM. ARDEIDÆ.

SUBFAM. ARDEINÆ.

352. *Botaurus lentiginosus*, *Steph.*

FAM. CANCROMIDÆ.

SUBFAM. CANCROMINÆ.

353. *Cancroma cochlearia*, *Linn.*

FAM. EURIPYGIDÆ.

SUBFAM. EURIPYGINÆ.

354. *Euripyga major*, *Hartl.* ♂.
" *helias*, *Lawr. nec Pall.* No. 133 of Part I.

A very fine specimen in the present collection shows the Panama species not to be *helias;* its size is much larger, the plumage of the back is umber brown crossed with blackish-brown bars, the wing-coverts bluish-grey; the bands across the quills are broader and of a deeper chestnut than in *helias*, in which the ground color of the upper parts is pale fulvous or light rufous intermixed with grey, and conspicuously barred with blackish-brown, being much more variegated and the contrasts of color more decided. The under mandible in *major* is deep orange; in the Brazilian species pale yellow.

The comparative measurements are as follows:

E. major, length 19 in.; wing 9; tail 7; bill 2½; tarsi 2⅛.
E. helias, " 15 in.; " 8; " 6; " 2; " 1⅝.

I think it probable that all the specimens from Central America referred to *helias*, will prove to be of the above species.

Fam. TANTALIDÆ.

Subfam. IBINÆ.

355. *Harpiprion Cayennensis* (*Gm.*). ♂.

Fam. SCOLOPACIDÆ.

Subfam. SCOLOPACINÆ.

356. *Macrorhamphus griseus* (*Gm.*).

Subfam. TOTANINÆ.

337. *Gambetta melanoleuca* (*Gm.*).

Fam. RALLIDÆ.

Subfam. RALLINÆ.

358. *Aramides ruficollis* (*Gm.*). ♂.

Head and neck bluish cinereous, top of the head brown; the upper part of the back, smaller wing-coverts and scapulars are clear olive-green; greater wing-coverts and wings rufous, the primaries with dusky tips; the middle of the back is brown gradually deepening to black on the rump and upper tail-coverts; tail black; the throat is nearly white; breast deep rufous; abdomen, sides, and under tail-coverts black; thighs greyish brown; circle round the eye vermillion; bill dark olive-green, lighter at the end, and dark yellow on the sides at the base; legs and feet bright crimson, claws dusky.

Length 13½ in.; wing 7½; tail 2½; bill 2⅜; tarsi 3⅛.

359. *Porzana Carolina* (*Linn.*).

Fam. STERNIDÆ.

Subfam. STERNINÆ.

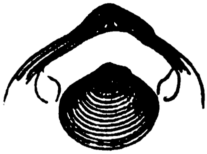
360. *Hydrochelidon plumbea* (*Wils.*).

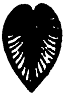
XLI.—*Descriptions of Two New Species of Mollusca of the Genus* CORBICULA.

BY TEMPLE PRIME.

Read February 17, 1862.

1. **Corbicula Larnaudieri,** nov. sp.





T. ovato-transversâ, inæquilaterali, convexiusculâ, antice paulo longiore, utraque extremitate rotundatâ; umbonibus parvis, turgidulis, integris; lunulâ ovato-lanceolatâ, pallidâ; sulcis distantibus; epidermide flavescente-viridi, vestitâ ad umbones atroviolascente radiatâ; intus violaceâ; cardine inæqualiter tridentato; dentibus lateralibus angustis, tenue striatis.

Long. 13; lat. 11; diam. 7 mill.
$\frac{1}{2}$; $\frac{7}{16}$; $\frac{5}{16}$ poll.

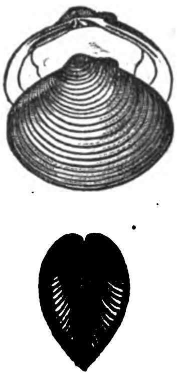
Hab.—Siam. (My Cabinet.)

This small species is somewhat convex, slightly inequilateral, the lunula is distinct, the beaks though small are a little raised and curve inwardly, the striæ are regular and far apart, the epidermis is glossy and of a yellowish-green color, with distinct markings of dark violet on the beaks.

Somewhat like the *C. tumida* from Borneo; it is, however, smaller, less heavy, more inequilateral, less convex, the striæ are not so far apart, and the epidermis is of a lighter and brighter color.

The *C. Larnaudieri*, so called in honor of the Abbé Larnaudier, was discovered in Siam by that gentleman, who formed part of the embassy sent to that country a few years since by the French Government; he only collected the two specimens now in my cabinet, which I obtained from him through Mr. Bernardi of Paris.

2. Corbicula mediocris, nov. sp.



T. ovato-transversâ, compressiusculâ, subæquilaterali, tenui, latere antice subangulato, postico subtruncato; umbonibus tumidis, brevibus, lævigatis; lunulâ ovato-lanceolatâ, pallidâ, lævigatâ; transversim regulariter sulcatâ; epidermide flavescente-viridi, vestitâ ad umbones atro-violascente radiatâ; valvis intus violaceo-rubris; cardine angusto inæqualiter tridentato; dentibus lateralibus brevibus, angustis, albis, tenue striatis.

Long. 22; lat. 17; diam. 11 mill.
$\frac{7}{8}$; $\frac{11}{16}$; $\frac{7}{16}$ poll.

Hab. ? (My Cabinet.)

This species is comparatively delicate, it is nearly equilateral; the anterior side is somewhat distended and angular, the posterior being abrupt, the beaks are small and not much raised, the lunula is distinct and of a lighter color than the rest of the shell; the striæ, though somewhat coarse, are regular and close; the epidermis is yellowish-green, the valves very little convex are, in the interior, dark purplish-violet.

Compared with the *C. occidens*, from India, to which it is closely allied, the beaks are smaller, the hinge is slighter, but the main difference consists in the fact that in the *C. mediocris* the anterior side is distended and angular, whereas in *C. occidens* it is rounded.

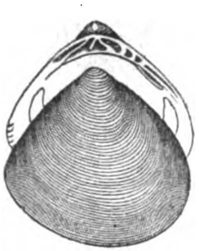
XLII.—*Description of a New Species of Mollusca of the Genus* VENUS.

BY TEMPLE PRIME.

Read February 17, 1862.

Venus (Gemma) Manhattensis, nov. sp.

Jay's Cat. iv. ed. Suppl., p. 466—1852.



Magnified nine times.

T. parvâ, triangulari, subæquilaterali, nitidâ, transversim striatâ; sulcis distantibus; marginibus crenulatis.

Shell small, triangular, nearly equilateral; beaks somewhat raised, generally eroded; valves moderately compressed, within white; exterior shining, white, striæ somewhat coarse and distant, though regular; teeth divergent, strong, distinct; muscular and palleal impressions very distinct; sinus small, acute; inner margin crenulated.

Long. $\frac{1}{8}$; lat. $\frac{7}{64}$; diam. $\frac{1}{16}$ inches.
" 3; " $2\frac{1}{2}$; " $1\frac{1}{2}$ mill.

Hab.—The State of New York, in the East River, and at Greenport, L. I.

(Cabinets of Jay, Gould, Sanderson Smith, and Prime.)

I dredged half a dozen specimens of this species in 1852 at Hell Gate, between Mill Rock and the mouth of the Harlem river, and having submitted them to Mr. Stimpson, who pronounced them distinct from the *Venus gemma* Totten, I distributed them as a new species. Since this time Mr. Sanderson Smith has found it at Greenport in more abundance and in company with the *V. gemma*.

Comparing this species with the *V. gemma*, I find that it is smaller, more triangular, less full, less elongated; its uniform white color, moreover, renders it distinct, as the purple tinge is one of the characteristic marks of the *V. gemma.*

Doubts having arisen with some as to the *V. Manhattensis* being distinct from the *V. gemma,* I referred the matter to Dr. Gould, sending him specimens from Hell Gate and from Greenport. The distinguished conchologist of Boston, with his usual kindness, gave the matter his attention, and a short time since wrote to me as follows. "I have examined the little Venus, and am of opinion that it is distinct. It is not only small, white, triangular, but the concentric striæ are coarser and more distant. It is not likely that so broad and uniform a variation would occur in localities so near each other. Were they culled from among other specimens of the ordinary *gemma?* I could not find one like them in a handful which I have. This adds to the probability of its being distinct."

The section of the genus Venus to which the *V. Manhattensis* belongs, has been separated from the original genus, by Mr. Deshayes, and called Gemma. Mr. Stimpson has adopted this new classification in the Smithsonian check lists, by placing the *V. gemma* under the name of *Gemma Tottenii.*

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[The names of new species, or concerning which new information is given, are printed in Roman letter; and the first number indicates the pages on which the new matter will be found: synonyms, and species to which only incidental reference is made, are in *Italics;* and names of families or higher divisions in SMALL CAPITALS.]

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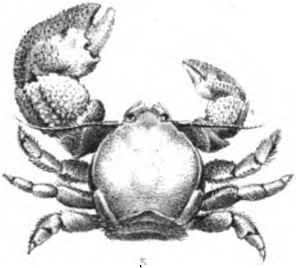
ERRATA.

Page 96 5th line from the top for Bonafouxianum read Bonnafouxianum.
97 22nd " " bottom for Denaluvilliersi read Denainvilliersi.
98 1st " " top " Denaluvilleirsi " Denainvilliersi.
99 18th " " " " Jengusi " Jenynsi.
101 1st " " " " Roch " Koch.
111 11th " " bottom " ereatures " creatures.
113 7th " " top " Kerandrenia " Keraudrenia.
114 17th & 18th lines from the top for " " "
115 8th line from the top for Cyrena violacea read Cyclas violacea.
115 22d " " " " Delast " Delest.
117 10th " " " " bicrobiculato " biscrobiculato.
259 2nd " " " " Dandin " Daudin.
276 7th " " " " Rodgers " Rogers.
276 7th " " bottom for Cyrstoceras " Cyrtoceras.
278 2nd " " " " Rodgers " Rogers.
280 2nd " " top " transparent " transported.
281 8th " " bottom " Claurach " Claverack.
291 3rd " " top " Jacameraps " Jacamerops.
301 7th " " " " Chæmepilia " Chamæpelia.
301 2nd " " bottom " Parinæ " Parrinæ.
328 7th " " " " plumbiceps Scl. read cinereiceps Scl.
330 10th " " top " lords " lores.
336 6th " " " " situate " situated.
338 12th & 15th lines from the top for Gallapagos read Galapagos.
352 6th line from the bottom for marginatus Lay " marginatus Say.
355 15th " " " " Gossei Ad. " Gossei P.
376 1st " " top " *Heterodontes* " *Heterodontus*.
381 4th " " " " *Scynnus* " *Scymnus*.
386 10th " " " " *Notidenidæ* " *Notidanidæ*.
386 26th " " " " sections " divisions.
388 22nd " " " " *Polyrrhizodus* " *Polyrhizodus*.
" 23nd " " " " Or " Owen
" 34th " " " " *Centropodus* " Centrophorus.
394 27th " " " " these " those.
398 22nd " " " " 1815 " 1855.
402 24th " " " " Cnvier " Cuvier.
403 last " " *Heterodontes* " *Heterodontus*.
407 penultimate line " homogenous " homogeneous.
410 " " " *Isoplagiodus* " *Isoplagiodon*.
418 10th line from the top for *tuberculatum* " *tuberculatus*.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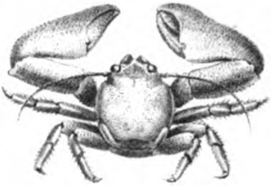
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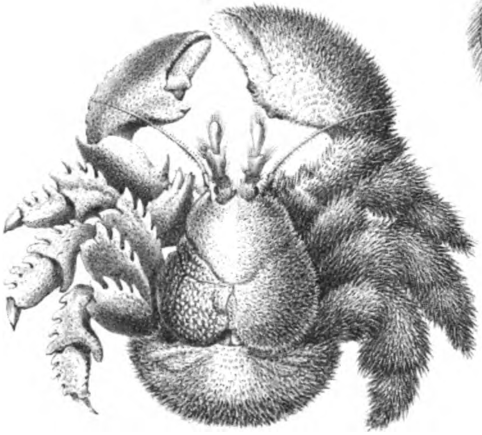
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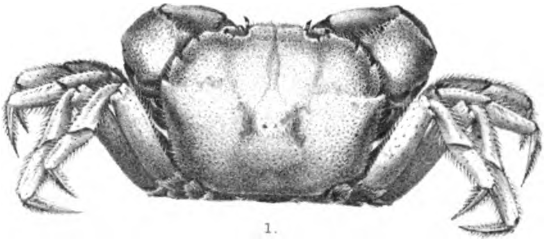
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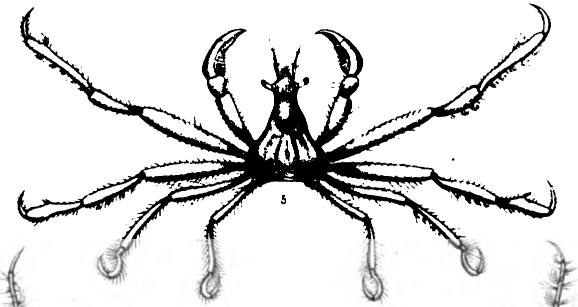

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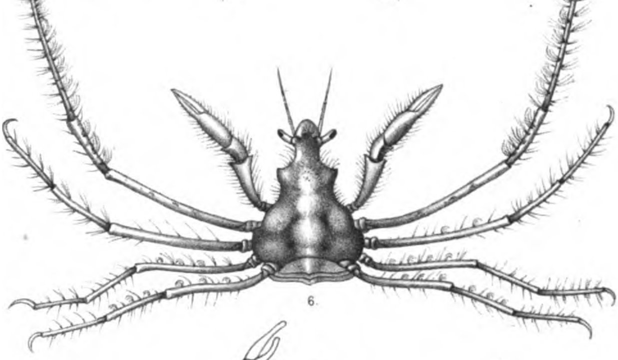

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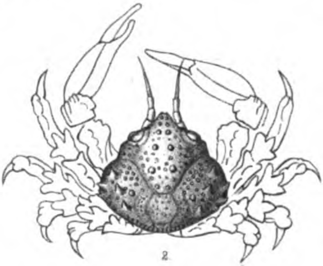

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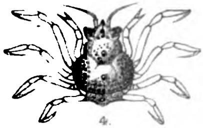

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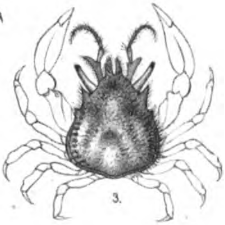

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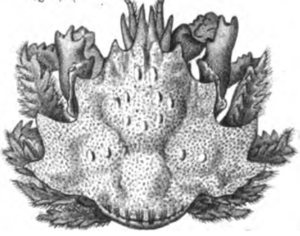

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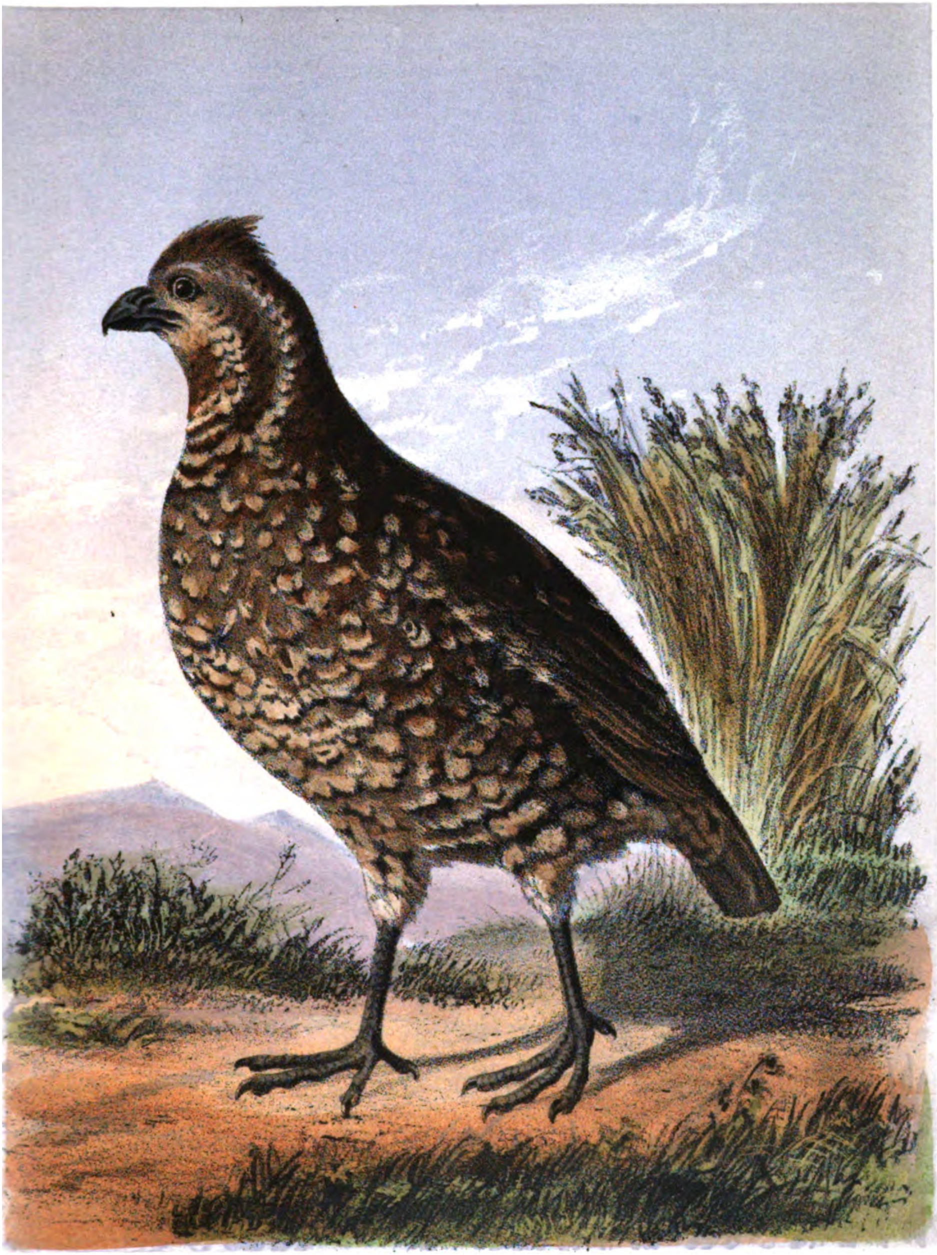

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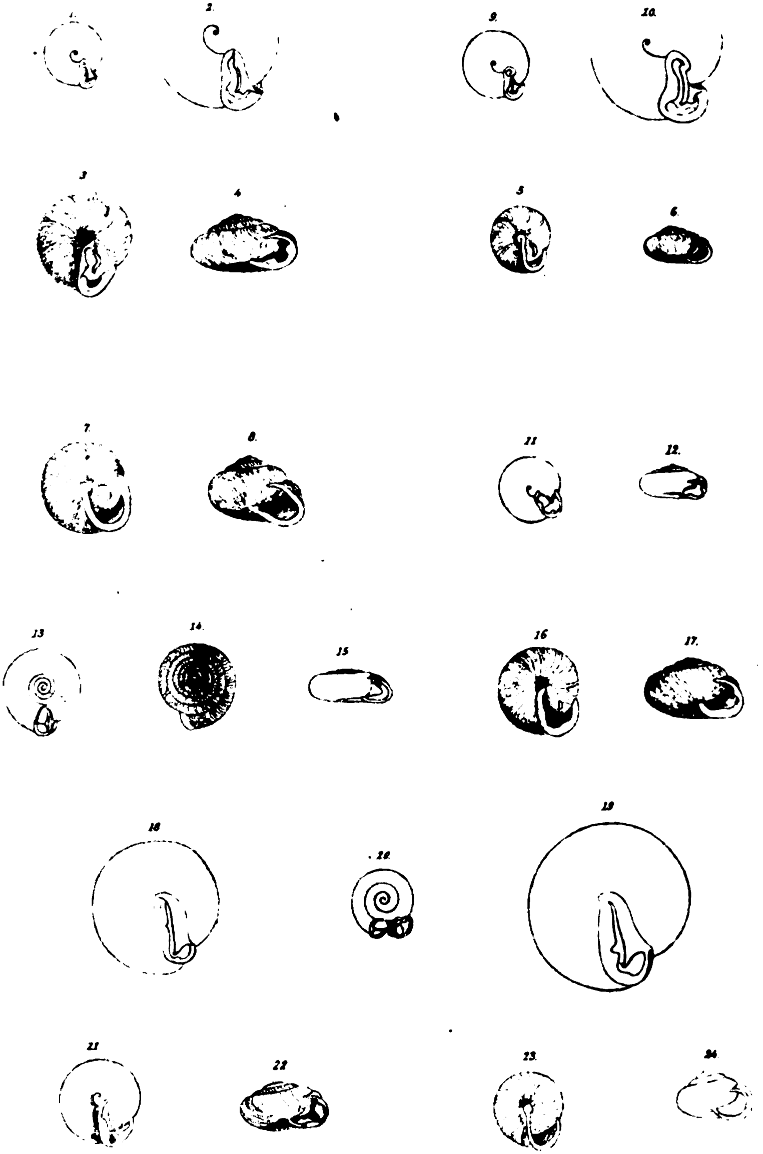

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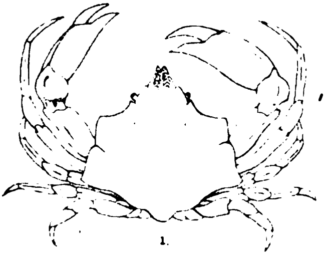

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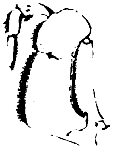

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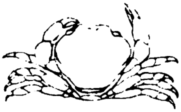

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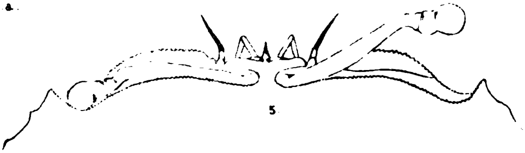

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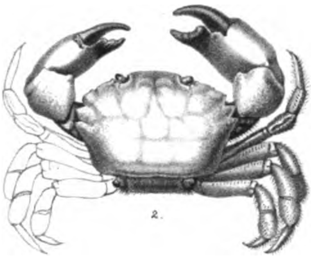

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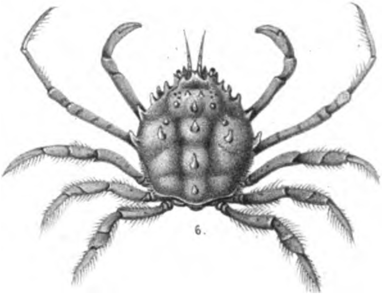

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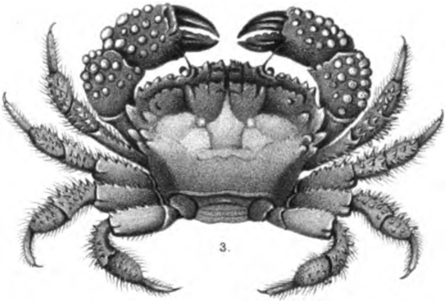

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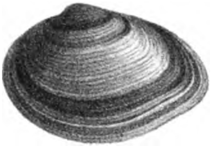

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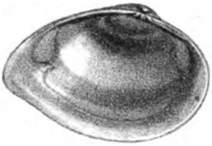

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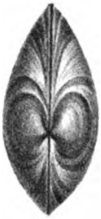

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